

ARBORETUM BULLETIN

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The Arboretum Bulletin



Wild Flowers in the Olympics As I Have Seen Them

LOIS CRISLER*

FOR many years my husband and I have lived in the Olympic wilderness, most of the time in a moss-chinked pioneer log cabin, seven miles from the nearest neighbor, fifty miles from a human being in all other directions, and three miles even from the narrow, winding, mountain road at the side of which our car stands out, winter and summer. For nine months, as aircraft warning observers, we were snowed in, in the highest lookout kept open in the Olympics during the winter. In summer we back-pack into the interior beyond the trails to film the wilderness and its inhabitants.

The wilderness as we have come to know it is not "scenery." It is something so rich and complex that a man-planted park looks thin and empty in its sterile prettiness beside even the most barren part of a living wilderness. The elk, the deer, the storms, rocks, wildcat, rivers, and flowers—all are strands in a living complex, the web of the wilderness. The wilderness is a home.

The Olympic wilderness is a nest of peaks and ridges carved out by brief rushing rivers that flow in their vast canyon-like timbered

valleys, from snow and glaciers to salt water in only thirty or forty miles. In any direction the diameter of the four thousand square miles of the Olympic wilderness is from forty to seventy miles. In these mountains, altitudes mean something different from altitudes say in Colorado, where the Hudsonian life-zone falls between ten and eleven thousand feet. In the Olympics, the treeless arctic-alpine zone itself falls between five and eight thousand feet elevation; the Hudsonian from thirty-five hundred to five thousand feet, and the Canadian zone to as low as fifteen hundred feet.

Our log cabin is down in the Canadian zone on the north side of the Olympics. Hurricane Lookout, where we wintered, is straight above it at an elevation of nearly six thousand feet, in the arctic-alpine zone. We moved up to the home of the alpine flowers at the beginning of the season that tests them, for no annuals can survive up here; the growing season is too short. The plants must winter through. It was a late October afternoon when we drove across the last saddle, no wider than the road itself, and rammed our car dizzily up the steep zigzags to Hurricane Lookout. Above and ahead of us the little square gray building on the tip of the mountain looked slight and desolate for shelter through the winter ahead. We set off our baggage in the woodshed; that night the wind drove coal-dust into the heart of the last leaf on every head of cabbage and the center of every sheet we had brought. It was Hurricane all right. Inside of two weeks

*Mr. and Mrs. H. O. Crisler have become renowned throughout the Northwest for their beautiful contributions to the knowledge of the Olympic Mountains back-country through the medium of their striking colored motion pictures. If you have not seen these movies you should arrange to do so as soon as possible for in them there is sheer beauty on every hand, with timely admixtures of grandeur and majesty and dignity, and with appropriate contrasts of daintiness and delicateness, as can only be portrayed in lovely composition and color by the Crislers' hands.

We are happy to be able to give to our readers Mrs. Crisler's comments on the native wilderness flowers which she has come to know so well.

the wind was joined by powder snow that sifted through the invisible cracks even onto the omelet, frying on the stove. Here, on the very crest of the mountain, the snow did not at first accumulate as it did below; it scoured the rocks and blew in wild clouds around the lookout. The rocks in front of our door began to look strange in this gray, bitter weather; along their every angle shelves of ice built into the teeth of the wind. At last the lookout was drifted to the eaves on the north side and furred white on the other sides with two-inch arrows of powder snow, shot on spicule by spicule.

Below the lookout there was a natural ski amphitheater, the Marmot Bowl, open on the far end to enclose a view of the black-cragged summit of Mount Angeles. When the pointed shadows of the few white clumps of alpine firs stole across its glittering floor, it looked too perfect. It looked immutable. If time could be accelerated, it would give an emotional effect that we underpass by creeping through it, a day at a time. As winter failed in the mountains I would have liked to set a motion picture camera in front of the last fir clump facing toward the head of that Marmot Bowl and expose a foot of film each day. First the powder snow ceased to race out in clouds above the rim of the bowl. Then the great cornices at the head of the bowl crumpled and dumped boulders of snow on the slope below. The snow settled into itself and became shining and heavy.

One hot April day I contoured in on skis at the upper end of the broken cornices, below a crag that jutted out on the north face of the bowl. Suddenly the snow shifted under me. It buried my skis and legs and sat me down. Pure terror shot through me as the movement lifted under me and carried me downward. I heard a rushing noise behind. Then around me the snow began to crumple into boulders and I became stationary, sitting very stately and scared in a dimple of snow at the bottom of the Marmot Bowl, with one unbroken piece of snow behind me like a delayed sitzmark. The noise increased. Looking over my shoulder I saw sheets of snow letting go all along the top of the bowl, leaving a wall against the blue and

exposing the old yellow hard snow as they slid. I saw my husband up there, a little black figure motionless with attention. The uproar and commotion continued as slides started on the opposite side. Afterward my husband said it was one of the most beautiful sights he had ever seen, the sheets moving down unbroken, then the pattern coming up out of the snow.

That hypothetical camera down in the bowl should have recorded sound too. For as spring advanced and the snow sank and veined like a leaf, the noise began—the jolly noise of running water and presently the noise of frogs. The bare patches widened, tender green followed them, 'till the whole Marmot Bowl was alive—awake, alive, and crowded. Banks of flowers—yellow glacier lilies, white avalanche lilies, and miner's lettuce—mingled with banks of snow where the avalanche had left drifts.

As these late-lying drifts melted, the alpine flowers betrayed their strategy, to have their buds ready and to hold them low. Under the very edges of the drifts sprawled the miner's lettuce with its clusters of buds on red stalks flopped over as limp and vital as a new-born fawn. Green spears of avalanche lilies clasping their white, ascending, bud-thawed chambers in the snow. Speed and secrecy are the tactics of flowers here on the eaves of the world. In the arctic-alpine zone in the Olympics more than three-quarters of the species are cryptophytes and hemicryptophytes,¹ named from the Greek root "crypt," meaning hidden or secret, because their buds are either hidden under the soil or snuggled against it. And all the rest keep their buds sheltered under snow or leaves, not one takes the fatal risk of flaunting its bud a foot high. That is for the phanerophytes down in the easier Hudsonian zone, and lower.

These alpine flowers can't afford to miss a bet. If there is going to be some warm weather they want to get started. In December came a partial thaw and we noticed a little new growth, a few tight, dark, leaf-bud clumps. In the false spring that comes in February we found out what they were. Among their

1. Jones, George Neville, "A Botanical Survey of the Olympic Peninsula, Washington." P. 58.

chunky ground-hugging buds there opened the flash of yellow buttercups. After that the snow buried them again for weeks. When they reappeared, the flowers were as fresh as ever, except for the fact that they were bleached snow-white. Each time they got their heads out of snow they rushed open fresh buds, till finally along the top of the brown talus slope where the snow left first, buttercups in full bloom wreathed and showered in countless patterns of green and gold, hemmed in by snow. A wee, fat, red bug often crept over the petals, like a dab of cochineal. I don't know his name but he seemed to belong to the buttercups.

On the crags, too, color appeared, only it was the rosy pink of douglasia, like the color of heather and many other alpine flowers. The typical locale for flowers in the Olympics is not "parks" as on Mt. Rainier, but talus slopes and crags.

One morning in March the chipmunks dehibernated. They raced around the lookout and shoved each other off the branches of the low alpine scrub. They nibbled douglasia and miner's lettuce blossoms. Now and then for some reason one made a long barefoot pilgrimage across the cold wet snow-field below the lookout, pausing now and then like a small dark dot. On the morning of May 8, a great event occurred: the marmots dehibernated.

By the first of June the terrace-like outcroppings of the cone which the lookout topped, were laced with an alpine garden—rosy-bells of *Geum campanulata*; fragrant gold cupolas of wallflowers; sturdy cream-colored anemones with blue sepals; pinguicula, like violets; carpets of pink and white phlox. In the meadow skirts that fell away from the rocky cone, concentric rings of miner's lettuce followed the snowdrifts inward till a drift of flowers replaced the drift of snow. Baby horned larks sat in the lee of grass tufts. The marmots lazily dragged their tawny bellies along the ground, nibbling the same flowers the chipmunks liked. The snowshoe rabbits hid in the low scrub, where fingers of sunlight found their lustrous fur. It was spring—full spring—in the high country.

Spring in the low country is different.

In our log cabin by the Elwha River at noon of the first warm day in May, Cris came in from the garden to a disturbing situation. I slammed a cold sandwich before him and said tersely, "I'm going to the car." At least that was a destination—three miles away.

My husband ate the sandwich in silence. "Let's go to Elkhorn," he said then, quietly. I looked at him in sulky surprise. Elkhorn is the guard station ten miles up the Elwha, occupied only in summers, by a fire guard. In an hour we were on the trail, each with a packboard carrying sleeping bag and provisions. At the upper end of our clearing we took into the black-floored fir forest, up old Slippery, to intersect the upper Elwha trail. It led through a bit of pine forest, rare on this side of the mountains, then dipped down into the dank canyon where the Lillian River flows white between its mossy boulders. Slowly we climbed out on the other side, up and up for two miles. All winter no human being had traveled this trail, but there were signs of plenty of traffic. It was trampled with fresh elk tracks. The elk were on the move, heading from winter quarters toward the high country, and they were not far ahead of us. On top of their tracks were printed the big pads of a bear and a cougar, the nine-foot cat of the mountains.

Six miles up-river we came into exotic-looking terrain, a flat where dry moss rippled over the ground and poured over the logs; out of it rose the fir trunks to support the forest roof far overhead. Over against the mountain-side we saw, moving through the brush, the dark brown heads of the elk—thirty of them, their pale bodies tinged with the green forest light.

When at twilight we broke into the old green clearing at Elkhorn, with its weathered barn, open forest shelter, and old log ranger cabin, there were five deer grazing, which at our approach bounded off into the forest with the level soaring bounds of the Columbia Blacktails.

In the morning as we walked deeper and deeper into the wilderness the varied thrush sawed his one long trilled note. The hermit thrush flitted silently from the branch over the trail. Robins scolded us to their nests.

Now and then in the forest were openings where bright moist mosses carpeted the ground, some with tiny "leaves," some with furry branches, some like sword ferns, and others palm-like. They grew so low and dainty, starred with white flowers, that it was like walking through Lilliput, except for the fact that a hundred-and-fifty-foot-high forest fenced them in!

At the far edge of one such mossy patch a black bear, the only kind found in the Olympics, browsed on huckleberry bushes, his back toward us. I set my still camera at fifty feet and started toward him stealthily, hardly noticing when I stopped to change the focus to twenty-five feet, that Cris was right at my elbow, his hand in his pocket. I stopped again to change to fifteen feet, then moved ahead, beginning to wonder which way the big fellow would choose to run, surprised at such close quarters. I stepped onto a stone just behind him and piped out, "Hello, old man!" The massive black head turned barely a fraction and the same instant the big paws started working. He never even bothered to finish turning his head, and all I got was a superb picture of a big black rump. When I turned to smile at Cris still right beside me, I saw his long-bladed pocket knife open in his hand. He, too, had not been sure which way the bear would rush.

We crossed tributary streams breaking white around boulder islands, each crowned with sword-fern and shining fronds of young hemlock a yard high. The bases of the brown fir pillars around us were suffused in the showery green of hemlocks still young, but twenty-five feet high.

At a right angle in the river I climbed down a low bluff to a "lawn" of palm-tree moss three or four inches deep and dropped full length in its dry softness. From where I lay I looked down at the transparent alpine green-blue of the river framed in the blue-green of firs and the yellow-green of moss. From under my bank a water ouzel flew to meet another that stood dipping on a gray boulder out in white water, then flew away leaving the one out there standing for a couple of minutes without dipping. A male harlequin duck floated by,

incredible in his black, chestnut, and white stripes. I was so absorbed in the beauty and life around me that till now I had not noticed the little Calypso,² the wild orchid, close to me in the moss, holding her red-violet head, with its tiger stripings, bent proudly at the tip of the four-inch stem. She was not alone. As I looked I saw many others standing knee-deep in the moss.

The forest is not a flowery place. Early come the yellow johnny-jump-ups, then the white adder's tongue with its spotted leaves,³ the queer wild ginger blossoms near the maidenhair fern along cascading streams, stands of vanilla leaf, acres of them, making a green forest floor a foot above ground, spring beauties, white-starring acres under the thick-mossed, gnarled maples along the river. On dry forest banks the stiff pink cups of the evergreen herb, pipsissewa, hang upside down on their foot-high stems above a bright rosette of leaves. And among the evergreen of the Oregon grape, spikes of lemon-yellow bloom fill the forest with leemony fragrance, the blossoms as lemon-tart to eat as they are to smell. Coral-roots are common, and once in a while on a dry shady bank a barber-pole—allotropa—will take your breath with its tall, glistening, candy-striped stalk. But still the forest is not flowery, like the high country.

Spring in the Hudsonian zone is something still different from spring in the arctic-alpine or in the Canadian zone. Here in July, after heavy spring snows, you may find all seasons at once, the early flowers that were retarded by snowdrifts or shade rushing their blooms near the first of the late summer flowers. Avalanche lilies are still fighting out of snow-banks beside which knobby, indistinguishable herbs are shooting up from the bare wet earth. A few yards away the same herbs are in full bloom, valerian, knee-high, among the lush Hudsonian meadow flowers, from fluffy white *Trautvetteria grandis* and mertensia, to tiger lilies and columbine.

Last summer my husband decided to make a new flower picture of the high country and
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2. *Calypso bulbosa*.

3. *Erythronium oregonum*.

Our Experience With Herbaceous Peonies

ROY AND GLADYS LEIGHTON*

AFTER growing herbaceous peonies for the past fifteen years we can assure you that our enthusiasm for them is genuine. They are certainly worthy of greater use in all sunny gardens.

They are, without a doubt, one of the most satisfactory of perennials and for many reasons. There is color and beauty of both flower and foliage for a much longer period of time than with most other perennials. From the very first signs of the new foliage breaking through the ground in the early spring the plant is a brilliant spot of color. Then, as it develops, a definite line and pattern takes shape with the leaves changing from the more brilliant red to bronzy and bright green. Even at the close of the season in the early fall the whole plant picks up the autumn tints and closes the season in close harmony with nature's best-dressed flora.

Recognizing the true value of the plant itself might be sufficient but when one adds to this the wide range of flower colors, the many types of flowers which vary from singles to tight doubles, and the mild fragrances of rose, orange blossom, cinnamon and other lovely familiar perfumes which most of them carry, one wonders why there is not even greater use of such a fine hardy perennial.

The peony connoisseur and enthusiast has undoubtedly already discovered the many uses of the intensely interesting growing habits of the not-too-easy-to-obtain species. Their variations in habit are from the small fern-like leaves of the *P. tenuifolia* group to the very early, large-leaved *P. macrophylla* (*P. tomentosa*) from the Caucasus region, and the tall, wiry, nodding or weeping blooms of *P. anomala*. Then there is *P. Mlokosewitschii*, a species with a tongue twister of a name but a rare garden plant. It is the only truly yellow herbaceous peony and one of the most beauti-

ful of hardy plants. It is a very early and abundant bloomer that is not only remarkable for its flower color but also for the unusual gray-green foliage that is not found in any other species. Another worth-while form with a definite individuality is *P. Emodi*, the Himalayan peony. It is very tall, with nodding, white, flowers and extremely handsome foliage. For a background effect it may be put to many uses.

The peonies require a minimum of care for the small space occupied. They enjoy a more alkaline than acid soil and therefore are wonderful companions for lilacs and plants with similar soil requirements. Plenty of sunshine and good soil drainage are absolutely necessary, so when planting take this precaution into consideration. Many of us have also made the common mistake of planting too near to trees and bushes that gradually grow large and not only affect the peony roots by gradual starvation but further hamper the development of the plant because of the change in exposure from full sun to too much shade.

There is probably no better use for the peony than in the mixed perennial border. Here it is able to receive the much needed exposure to sunlight during the dormant winter months when other perennial plants have been pruned of their withered stems and foliage.

When massed plantings are possible a complete bed of them is a sight to behold, and they may be used many times with telling effect where a semi-tall border is possible. For best results the plants should be set 30 to 36 inches apart.

An interesting effect that we have obtained is through the use of peonies with delphiniums as a background. The color contrast is perfect. The blooming periods are supplementary, thus prolonging the flowering season. The soil, exposure, and drainage requirements for both types are quite identical and the foliage contrast throughout the growing season is pleasing.

*In their beautiful garden at Edmonds, the Leightons have approximately 350 species and named varieties of herbaceous peonies under cultivation. This statement is sufficient to demonstrate the great garden value which they place upon them. In addition, their fifteen years' experience in growing peonies is more than enough to enable us to say that they speak with real authority.

Failures with peonies are more often due to bad planting than to poor roots. The ground should be prepared in advance and must be deeply dug. Two feet is not too much, 18 inches is a minimum and the hole where the root is to be set should be filled with good friable loam. Some manure at the bottom will be advantageous but it must not come into contact with the roots. We like to use clumps of sod or similar material that is slow to decompose, placed in the bottom of the hole for future nourishment. When planting, the buds or eyes which are always visible should be placed so that they will be covered with two inches of soil. Measure, don't guess, as this is important.

The root crown requires nature's sunlight. There is no danger of the root freezing or of the eyes being damaged by frost, for the peony is thoroughly hardy. Soil that is placed about the root should be well worked in and firmed. This is a good time to mix a handful or two of bone meal and some ground lime rock with the soil. Raw bone meal is best but today we use what we can get. An additional application once a year is sufficient.

Refrain from using barnyard manures and strong commercial fertilizers. If extra-large blooms are desired we suggest buying varieties noted for their large flowers rather than to force the plant to bear bigger blooms through over-fertilization, at the risk of losing the plant.

Newly-set peonies should not be expected to give much bloom the first year after setting. Better results will appear the second year and typical blooms from the third year on indefinitely.

Cut the faded blooms after the flowering season but spare the removal of the plant foliage until the last thing in the fall, when it may then be cut, dried and burned. Leaving the foliage until this time is essential, as it is through the foliage that the roots renew their strength for the next year.

If you wish to use peonies as cut flowers, cut them in the evening, slit the stems for about three inches from the base, then place in a bucket of cool water over night. If picked in the half-opened bud stage they will last a

week or more, depending upon the humidity. Picked in this stage the true color will be more evident than if left to fade in the sun.

When thinking of peonies many people refer at once to the red "Mother's Day" variety because of its earliness and the fact that it has bloomed consistently through the years in our grandmothers' gardens. However, far too few growers are familiar with the species as previously referred to, which start to bloom several weeks before the ordinary red "Mother's Day" peony, *P. officinalis rubra plena*. The other *P. officinalis* varieties are *rosa plena*, which is a lovely deep clear pink, and *alba plena*, which comes out a very delicate pink fading to white. All are doubles. The species are then followed by the hybrids, strains which are but rarely known or grown as yet on the Pacific Coast but which, when they become better known, will be much talked of among garden enthusiasts as desirable innovations. Few growers have them to release as yet.

The next to follow are the *P. albiflora* (*P. chinensis*) forms that originated in China, later to be greatly improved by European hybridizers, which today have been practically taken over by the American hybridizers. These are currently the most popular named types. They offer all one would desire in shades of color and in types of flowers which vary from singles to doubles and which show a significant spread in blooming period.

Some of the outstanding varieties are listed below, though no attempt has been made to include all the desirable ones:

White Single—Krinkled White is cup-shaped with crinkled petals. White Perfection is large and impressive.

Pink Single—Pride of Langport has large blooms of good color. L'Etingelante has unusual dark pink color and excellent form.

Red Single—Arcturus is a very dark red variety in a class by itself. President Lincoln is a tall plant with many petals.

White Double—Elsa Sass has large-petaled blossoms which are icy-white in color. Kelways Glorious is one of the older varieties but still consistently fine. Dr. J. H. Neeley is a more recent variety that has blooms of pure white.

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Notes on Some Colorado Foothill Shrubs

CHARLES H. HARRISON*

SINCE Denver is situated on a plain a mile above sea-level, the foothills and foothill plants reach altitudes that are surprising to a Seattleite. Winters are open, but no less severe for plants on that account. Shrubs that endure the repeated freezings, snowfalls, thaws and winds should prove hardy anywhere in Washington.

Fendler's ceanothus, *C. Fendleri*, favors the bare rounded shoulders of the hills at an altitude of six or seven thousand feet. Spreading out perhaps three feet while rising but one, the spiny branches and narrow leaves of this bushy little plant give it the look of a grayish and prostrate firethorn. In June, with its abundant display of white flowers, it could be nothing but a ceanothus. The flowers are the form and size of those of *Ceanothus* var. *Gloire de Versailles*, and quite as spectacular. Although it is just such a plant as Denverites want in their gardens, a nurseryman there tells me it has earned the reputation of being impossible to transplant.

The proudly-borne, opposite leaves and the neat, rounded, form of the mountain mock-orange, *Jamesia americana*, are just what might be expected of a relative of the cultivated hydrangea. I first saw this four- (rarely six-) foot shrub in fruit, and the large dry capsules led me to expect large flowers. I was disappointed to find the flowers small, and the waxy petals often tinged slightly muddy or greenish. *Jamesia* requires good drainage but grows anywhere the hillside is not too dry, flourishing in fairly good or rather poor soil, or even in the crevices of the rocks. It flowers abundantly from May to July. It is not without honor even in its own home, for it is planted in Denver gardens and is handled by at least one Denver nursery.

Their thimbleberry, *Rubus deliciosus*, has small shiny leaves, and more conspicuous blossoms than the Puget Sound form. The fruits

are shiny, purplish-red rather than dusty pink as in ours. Characteristically this four-foot shrub grows in canyons and gulches. Once, however, I noticed a beautiful white-flowered bush on the plains at the base of the hills. When I approached, it proved to be a particularly fine specimen of the same thimbleberry. Growing beside the shallow dry wash that carried the run-off from a small gulch in the hills, it had reached a height of five feet and a width double that. It was as well covered with bloom as any wild rose.

The wild plum, *Prunus americana*, is one of the finest flowering shrubs of the lower foothill canyons and gulches. Tangled thickets and small neat trees flower in April and May just before the leaf-buds open. The spicily-fragrant white clouds of bloom resolve themselves on close approach into delicate individual blossoms. The rosy filaments are prominent in the flowers of some bushes and, with similarly colored main veins in the petals, give the bloom a pinkish blush. Both this and the pure white type are altogether lovely.

Though an abundant and beautiful foothill plant, *Penstemon collinus* may not belong in this list, for it is shrubby only at the base. However, in our climate it should kill back but little each winter, and it should have a place with the small azaleas and heaths of our rock-gardens. It is a plant of rocky or at least of well-drained places, occurring throughout the foothill and montane zones and even up into the sub-alpine zone. It grows in the lowest foothills and even out onto the plains at their base. Here, at an altitude of about fifty-six hundred feet, it grows in scattered clumps among the sparse mountain mahogany. Sheet erosion from overgrazing has left it and the mountain mahogany perched on low mounds, yet growing and flowering as though undisturbed. Tufts of branched and matted root-stalks put out a cover of leaves and send up numerous erect stems carrying narrow four-inch flower-clusters. The graceful trumpet-shaped flowers are a fine deep blue.

(Continued on Page Twenty-six)

*Charles H. Harrison, who is associated with a prominent landscape designer of Seattle, was stationed in Colorado during his service with the armed forces and presents here his observations on one of the groups of plants he studied in that region. Mr. Harrison received his botanical training at the University of Washington.

Report on the Rhododendron Show, May 4 and 5, 1946

By DONALD G. GRAHAM, *General Chairman*

THE first Annual Rhododendron Show was held at the head of Rhododendron Glen in the Arboretum. The exhibits were housed in a colorful tent 70 feet by 25 feet. The east side of the tent was open and rhododendrons and azaleas were also exhibited on the slope facing the open side.

Approximately 3,000 people attended the show and many expressions of admiration for the rhododendron display were heard. Fortunately the weather was ideal.

A list of the winners in each class is appended.

The arrangement for the exhibits, particularly the trade exhibits, was handled by Dr. John H. Hanley, Director of the Arboretum, who also contributed in a material way to effecting other arrangements for the show and much credit for its success is due to his work as assistant chairman. Thanks are also due to Mrs. Arthur Krauss for her work as chairman of the Publicity Committee. Mrs. Krauss also assisted on other committees.

The general chairman also desires to thank the following committee chairmen: Mrs. Alexander B. Hepler, who designed and handled the staging of the show, assisted by Mrs. Paul Smith; Mrs. Louis Oulmann, who had charge of the arrangements, assisted by Mrs. T. C. Frye and Mrs. Harold B. Thompson; Mrs. Loren Grinstead, in charge of receiving exhibits; Mrs. J. Swift Baker, information; Mrs. Frederick Bunge, auditing; Mrs. A. H. Rousseau, tickets; and Mrs. James Wiley, society publicity.

The success of the show was a tribute to the untiring efforts of these committee chairmen. The employees of the Arboretum also worked hard in setting up the show and attending to the details of handling the two-day session.

The show was judged by P. H. Brydon, Granger, Washington; Theodore Van Veen, Portland, Oregon; and by John Henny, Brooks, Oregon, president of the American Rhododendron Society. The Society accredited the show and furnished the trophy rib-

bons. The officers of the Society, particularly Mr. Henny, Mr. George D. Grace, the secretary, and Mr. E. R. Peterson, the treasurer, as well as Mr. Brydon, vice-president, co-operated whole-heartedly with the Arboretum Foundation in setting up the classifications and is assisting with advice on this first Annual Show. In addition, numerous cut blooms were exhibited by Portland members of the Society.

By changing the location of the show in the Arboretum, and by rearranging the tent housing facilities, it is hoped to make next year's show more accessible to those who do not come by car and also to avoid the delay that some of those attending the show experienced in entering the tent.

The exhibitors, who at considerable trouble brought plants and blooms to the show, are entitled to the thanks of the committee in charge and of the Arboretum Foundation. The trade exhibitors, whose hundreds of plants helped to make it a bower of beauty, are to be thanked for their co-operation. It is hoped that they will aid in making next year's show an even greater success and that many more private exhibitors will find it possible to exhibit cut blooms.

It is believed the show was somewhat early for the majority of May flowering hybrids. The Foundation will welcome suggestions from growers as to a recommended date for next year's show.

Prizes Awarded

Class Number 1:

First prize: State Flower Nursery, Bothell
Second prize: Prentice Nursery, Seattle
Third Prize: Far West Nursery, Bothell

Class Number 2:

First prize: Mt. Meadow Nursery, Monroe
Second prize: Evergreen Nursery, Everett
Third prize: Hopkins Nursery, Bothell

Class Number 3:

First prize: None
Second prize: State Flower Nursery, Bothell
Third prize: Prentice Nursery, Seattle

Class Number 4:

First prize: Donald G. Graham (Mixed hybrid rhododendrons), Seattle
Second prize: Mrs. Don Palmer (Goldsworth Pink), Seattle
Third prize: None

- Class Number 5:**
 First prize: James Brennen, Woodway Park, Edmonds
 Second prize: None
 Third prize: L. N. Roberson, Seattle
- Class Number 7:**
 First prize: George Grace (Rosamund Mil-lais), Portland
 Second prize: Ralph DeClements (Earl of Ath-lone), Bremerton
 Third prize: None
- Class Number 8:**
 First prize: Ralph DeClements (Beauty of Littleworth), Bremerton
 Second Prize: Florida Voinot (Loder's White), Seattle
 Third prize: Donald G. Graham (Loder's White), Seattle
- Class Number 9:**
 First prize: George Grace (Canary), Portland
 Second prize: Donald G. Graham (Letty Ed-wards), Seattle
 Third prize: Ralph DeClements (Souvenir of W. C. Slocock), Bremerton
- Class Number 10:**
 First prize: None
 Second prize: Herbert G. Ihrig (Mrs. W. C. Slocock), Seattle
 Third prize: George Grace, Portland
- Class Number 11:**
 First prize: Florida Voinot (Mrs. G. W. Leak), Seattle
 Second Prize: Herbert G. Ihrig (Faggetter's Favourite), Seattle
 Third prize: Arthur Krauss (Corry Koster), Seattle
- Class Number 13:**
 First prize: None
 Second prize: Endre Ostbo (New Seedling), Bellevue
 Third prize: None
- Class Number 14:**
 First prize: Donald G. Graham (Lady Cham-berlain), Seattle
 Second prize: Herbert G. Ihrig (Rothschild Hybrid), Seattle
 Third prize: None
- Class Number 15:**
 First prize: None
 Second prize: None
 Third prize: Florida Voinot (R. decorum), Seattle
- Class number 16:**
 First prize: Donald G. Graham (R. neriiflor-um), Seattle
 Second prize: None
 Third prize: None
- Class Number 18:**
 First prize: None
 Second prize: None
 Third prize: Donald G. Graham (R. campylo-carpum), Seattle
- Class Number 19:**
 First prize: None
 Second prize: E. L. Reber (R. Thomsonii), Richmond Beach
 Third prize: None
- Class Number 20:**
 First prize: Mrs. H. B. Thompson (R. Augus-tinii), Seattle
 Second prize: None
 Third prize: None
- Class Number 21:**
 First prize: None
 Second prize: None
 Third prize: Herbert G. Ihrig (R. exquisitum), Seattle
- Class Number 24:**
 First prize: None
 Second prize: None
 Third prize: Ralph DeClements (Luscombei), Bremerton
- Class Number 27:**
 First prize: Donald G. Graham (Lady Rose-bery), Seattle
 Second prize: None
 Third prize: None
- Class Number 30:**
 Frst prize: Mrs. Arthur J. Krauss, Seattle
 Second prize: Mrs. Mansel Griffiths (Kurume Hybrid), Seattle
 Third prize: None
- Class Number 31:**
 First prize: Ralph DeClements (Loderi var. King George), Bremerton
 Second prize: Florida Voinot (Loderi var. King George), Seattle
 Third prize: None
- Class Number 32:**
 First prize: James Brennen (R. calostrotum), Woodway Park, Edmonds
 Second prize: None
 Third prize: None
- Class Number 33:**
 First prize: Far West Nursery, Bothell
 Second prize: Ralph DeClements, Bremerton
 Third prize: Roger Junot, Seattle
- Class Number 34:**
 First prize: Ralph DeClements, Bremerton
 Second prize: Prentice Nursery, Seattle
 Third Prize: Lingham's Nursery, Tacoma
- Class Number 35:**
 First prize: Mrs. H. B. Thompson (R. vaseyi), Seattle
 Second prize: Mrs. H. B. Thompson (azalea Mollis), Seattle
 Third prize: Mrs. Arthur Krauss (azalea Mol-lis), Seattle
- Class Number 36:**
 First prize: Herbert G. Ihrig (R. sinogrande), Seattle
 Second prize: Ralph DeClements, Bremerton
- Class Number 37:**
 First prize: Ralph DeClements (Susan), Brem-erton
 Second prize: Mrs. O. B. Thorgrimson (Van Nes Sensation), Seattle
- Class Number 38 (Special):**
 First prize: Mrs. O. B. Thorgrimson (Loder's White), Seattle
 Second Prize: Mrs. Mansel Griffiths (Loder's White), Seattle
 Third prize: Ralph DeClements (Loder's White), Bremerton
- Special Class:**
 First prize: Mrs. Mansel Griffiths (Elspeth, Slocock), Seattle
 Second prize: Mrs. Henry Isaacson (R. yun-nanense), Seattle
 Third prize: Herbert G. Ihrig (R. yunnan-ense), Seattle

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Camellias

MRS. VAN W. ANDERSON*
Portland Garden Club

THE early history of camellias is partially obscured as the native species in China passed on to Japan and to other parts of the Orient and then to Europe, but as the curtain rises and falls during their progress we have glimpses filled with mystery and romance.

Tradition has it that the first camellia seen in Europe was a shrub with glossy leaves and dazzling white flowers sent from the Philippines as a gift to Maria Teresa, wife of the king of Spain, from Father George Joseph Kamel, a Jesuit priest serving as missionary in the Far East and then resident in Manila where he died a number of years later, in 1706. It was Linnaeus who named the camellia for Father Kamel.

The first one known to cultivate the plant was Lord Petrie of Thorndon Hall, Essex, who in 1739 was growing the small single red *Camellia japonica*. This single red camellia is said to be the same one cultivated by the Japanese in their gardens in Kamel's time and it is the same stock upon which the so-called improved camellias are now grafted. The catalogue of the Cambridge Botanic Garden for 1742 is said to mention the "Camellia of Japan."

Berlese speaks at length of the wild woods camellia of China and Japan, *Camellia sylvatica*, which grows to such tremendous heights, forming tall trees, with narrower leaves than *C. japonica*, and flowering in October. One would think by this that *Camellia sylvatica* must be a forebear of our present lovely *Camellia Sasanqua*.

The white-flowering shrub sent to the Queen of Spain by Father Kamel thrived in her garden and caused a sensation among the botanists of that day. From this first early white *Camellia japonica* were developed, later, the semi-double types in England.

The East India Companies were instrumental in encouraging the cultivation of many of the rare shrubs of China and Japan. Linnaeus secured two camellia plants through the Swedish East India Company in 1745 who thought it might be the true tea plant so jealously guarded by China and eagerly sought by the rest of the world. In a frenzy to get a start of the tea plant Linnaeus himself imported one, thinking that this time it might really be the tea, but again it turned out to be only a camellia.

In 1792 Captain Connor of the ship "Carnatic" sent to John Slater, Esq. in England plants of *Camellia japonica flore pleno striata* and of *flore pleno alba*. In 1811 Captain Welbank and Captain Rawes introduced the white peony-flowered form and also a white sasanqua which became known as "Lady Banks Camellia." This same Captain Rawes in 1820 brought to Thomas Cary Palmer, Esq. the wonderful *C. reticulata* still considered the finest camellia of them all.

Horticulturists were now able to cross and produce their own plants and some of our best varieties date from the early 19th century.

After reading all the facts we can gather of their history we know that it was by the early trading vessels and through the great East India Company that camellias were first brought from the Far East and spread gradually through Europe and, who knows, perhaps this was the way the first one came to the new world. Spain was then in supremacy as a power and the great Manila galleons plied a rousing trade with the Spanish colonies on the west coast of Mexico at the port of Acapulco. It must also be remembered that Cortez had seized the great wealth of the Aztec cities and a little later Pizarro found even greater treasures of the Incas. The influence of Spain spread deep and far and with it that of the Orient, too, as Spanish ships came in laden with the products of the Far East. Even today some articles worn by the

*Reprinted in part by permission of the Garden Club of America. This article represents a part of the program on "Camellias" which was awarded second prize in the Garden Club of America program contest. The Camellia program of the Portland Garden Club represented a joint effort of the following committee members: Mrs. Alfred Herman, Chairman; Mrs. Van W. Anderson, Mrs. Graham Dukehart, Mrs. Philip Hart, Miss Alice Kendall and Mrs. M. M. Matthiessen.

Mexicans have a Chinese resemblance not only in appearance but in name.

Is it not possible that in Mexico and in Central America they, too, were hunting the precious tea plant and by mistake imported some camellias via the Philippines and the Spanish galleons? If so, some of those early ships have skirted our shores with their rich cargoes as they are known to have been blown north at times by storms. If it is really true that some camellias did come to Mexico in this way, then it is most certain that in time occasional ones must have crept northward into what is now California and in later days, perhaps, to Oregon. We do know that a few very old bushes have been found growing beside aged and decadent farm houses in the Willamette Valley and it is unlikely that early pioneers could ever have brought any camellia plants along with them on their hazardous journey by covered wagon across the continent.

One of the oldest camellia bushes found in western Oregon is said to be Kumasaka, and another a variegated red and white one. About sixty years ago a bush or two were brought here from the Orient by a sea captain and for many years since then there has been a heavy importation of camellia plants from Japan.

The vagaries of fashion have had a tremendous influence upon the development of camellias, ranging in their history from extreme appreciation to complete neglect. By 1870, or soon after, the vogue for camellias went out completely and except for the explorers who occasionally sent plants home to an uninterested world nothing whatever happened.

Renewed interest in them probably started in England when it was found that the plants were hardy in most parts of the British Isles. The interest continued throughout the years as the plant explorers sent there the results of their expeditions so that hybridizers were thus able to make outstanding achievements.

Many of the "tea ship" camellias were garden hybrids and it was only a short time ago that the parent form of the superb *C. reticulata*, the finest of all, was found. The plant, as we have known its history since 1813, is and

has been for centuries a hybridizer's production. It was introduced from Chinese gardens to the Royal Horticultural Society's garden in 1820, as it was possible to obtain garden plants at the Treaty ports long before it was safe to explore the interior for wild ones. In England it is regarded as the most splendid of all camellias. The growth is less dense and the leaves not so thickly placed on the branchlets as those of *C. japonica*, but they are larger, longer, toothed, and of a dull green color with a conspicuous network of veins. The flowers are four to six inches across, semi-double, with large undulated petals of a soft rosy red with a center of golden stamens. It grows well on walls in mid-Sussex, and in Cornwall it flourishes in the open woodland where the plants are about fifteen feet high with fine foliage and covered with open flowers and buds. There is also a bush near Fermoy, County Cork, that is no less than sixty feet around. The parent wild form is a native of Yunnan Province, in southwest China and grows at altitudes of 5000 to 9000 feet. According to a Japanese book the wild form is known in red, white, and pink and we have been told that the tree grows to great size in the woods where it is found.

The degree of hardiness of *Camellia reticulata* is still uncertain, but as it has been known to grow with complete success and to large size in some parts of England, we have hope of success in western Oregon, just as with many other plants which we formerly thought would not thrive so far north and which are now seen growing here with more luxuriance of leaves and blossoms than in southern climates. In fact, millions of young camellia plants are shipped from here each year by growers to all parts of the United States.

The climate of western Oregon is much the same as that of southern England in mildness and ample rainfall, except for two or three months in summer when it is usually warm and dry. Oregon gardens look to England and it rarely fails that what is good for English gardens is good for ours, too. We find a treasure-trove of material there and rely more and more on their explorations and their fine horticultural achievements.

Those in Oregon who know camellias and collect them are no longer interested in buying large plants of inferior varieties for immediate garden effects but are willing to wait for small treasures to grow up. Happily there is a way out for those who have handsome bushes with inferior blooms as they can have them grafted and the rate of their growth after being cut low is so rapid that in two or three years the new grafted tops will reach the height of the old bush.

The names of camellias in Oregon gardens would take many pages, some of them would be incorrect and many unpronounceable, if they retained the ones with which they arrived from Japan. But here are a few kinds which we all agree are outstanding and we would not wish to be without.

Among the white ones would be Purity, Grandiflora Alba, Alba Plena, Snowdrift, Mathotiana Alba, Caprice, which is slightly cream colored; the lovely single ones, Finlandia and Amabilis; and that double white winter-blooming sasanqua, White Doves.

Of the light pinks the favorites are Kumasaka, Pink Star, Pink Shell, Pink Ball, Rev. John Bennett, Magnoliaeflora, Otome, and Lady Humes Blush.

Among the sasanquas are Minina, Briar Rose, and Apple Blossom.

Popular deep pinks here are Grandiflora Rosea, H. A. Downing, Wakanoura, Francine, Lady Desaumerez, C. M. Hovey, Lady Vansetti, and the precious and most beautiful *C. reticulata*.

Among the rose-reds of various tones, our gardens abound in Arejishi, Col. Firey, Elena Nobile, Emperor of Russia, Flame, Goshoguruma, Te Deum, Vittorio Emanuele, Ville de Nantes, Gigantea, Fimbriata Superba, and Monjis Red.

Popular variegated ones are Chandleri Elegans, Fanny Bolis or Mikenjaku, Lady Audrey Buller, Monjis variegated, Bella Romana, and the lovely paler Sweetiana Vera.

For planting directions I pass on to you notes from a Portland Garden Club member who has been growing the most beautiful camellias obtainable for twenty-two years

with remarkable success and now has a camelia garden famous in the Northwest.

Mrs. M. M. Matthiessen says that in preparing to plant a camellia, it is wise to dig a hole three or four times the size of the ball of the plant, and this removed earth can be thrown on a canvas spread conveniently nearby. To the soil should be added an equal amount of sharp sand and the same of pulverized peat moss and all thoroughly mixed together. The next step is to put a few shovelfuls of both peat and sand in the bottom of the hole and dig it in, being sure to firm it a little so that the plant will not settle too much. After placing the plant in the hole and loosening the burlap away as much as possible without lifting the plant in order not to break the ball, for if you do, it might take a good nurse to save the plant. Now is the time to fill around the ball with the prepared earth on the canvas and next to water the plant well while taking care to pour the water around the ball and not on it. The final step is to put a thick mulch of peat moss on top and to keep the plant mulched at all times as a precaution against summer heat and winter cold, because camellia roots grow very near the surface.

In the case of older and more mature plants people have various ideas concerning the best fertilizers to use. One commercial grower who has outstanding success uses only barnyard manure one year old and amateurs have tried this with fine results, as it adds humus to the soil. It is also thought a good compost pile produces excellent fertilizer for camellias and there are good chemical mixtures to add to cottonseed meal which give a "lift" when plants seem lagging in growth and vitality.

Some camellia lovers who are patient and have a knack with growing things can add some special treasures to their collections by knowing how to make slips grow. According to the same member who plants so well and with such success, the proper procedure for doing this is as follows: choose a place with plenty of light and air but not in direct sunlight; the soil must never become hard and dry and at all times it must be kept moist or

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Aquatic Plants of The Grand Coulee, Washington

THEO. H. SCHEFFER*

IT may not be particularly informative to the botanist, but at least a reminder to the less versed in biology, to state that most of the aquatics fall in groups of the lower, more generalized forms of plant life. Waters of the earth are in general kind to their plant tenants—less exacting of high specialization and adaptations than are the land zones. The worst that can be said of any of the mothering waters is that in certain situations and from some sources they have taken on soluble ingredients of the land that limit their tolerance of species and kind, or have transformed these in the process of adaptation. With waters of the sea, which hold something of all soluble minerals, we have no concern in this discussion. But we have in the Grand Coulee the so-called hard waters of springs and lakes, as well as fresh waters. And there are alkaline waters which favor the growth of plant life only of their own choosing.

One must draw the line somewhere, even arbitrarily, in discussing aquatic plants. We have chosen to omit here the microscopic planktons; also the algae, which in slimy, sheet form spread over the horse trough and the reedy pond; or, in globules, fog up the waters of a clear lake in certain seasons until it is said to be "in bloom." It is easier to spot the aquatics in a semi-arid country than in a more humid zone like our coastal belt. The gray sage and other xerophytes crowd pretty close to the lakelet's marge and a green patch across the tawny waste suggests a spring. In addition to species that will germinate and grow in the water, we will admit to our plant fellowship here also others that must approach the shores quite closely for their water requirements.

When the turbulent ancestor of the river Columbia plunged headlong toward the sea gate to escape the sliding, grinding ice his way was barred at times by a rival—the vulcan

lava flows. But a detour was always to be found for young channels, while former channels began to be old. One such abandoned channel is the Grand Coulee, a replica of the one the modern river now occupies; its lava walls still towering high and at their feet a burden of weathered fragments in the angle of repose. With this brief introduction to the Coulee we will proceed to the present remnant waters of the gorge and the aquatic plants they support.

These waters are constituted now by a few small lakes, mostly in the lower Coulee; by springs which form ponds and small swamps; and by outlets and ditches, some of which have been diverted to the use of very limited irrigation or of livestock needs. Swamps and ponds, in addition to being spring-fed, receive here and there a limited influx of water from the hanging channels of the sagebrush uplands that front the Coulee—this only in flush season of rain or melting snow usually, but evidenced always by discoloration of the Coulee walls. It may be noted here that the waters of the upper length of the Coulee will lose their identity soon and be merged into the expanse of the equalizing reservoir destined to supply a thousand arteries of a new land that shall blossom as alfalfa and nectared fruits. An erroneous impression we have gathered here and there—that springs and lakes of the Coulee have increased their flow since construction of the Columbia River dam—may be corrected through understanding that the floor of the Coulee is considerably above the maximum surface level of this dam. In other words, the present river channel is eroded much deeper than is that of the glacial stream—the Coulee.

The lower Coulee, below the projected reservoir, is occupied by a disjointed but almost continuous chain of four small lakes, beginning with Park Lake at the north, followed by Blue and Lenore Lakes, and ending, so far as Grand Coulee proper is concerned, with Soap Lake at the south. In reality Moses Lake and the sandhill potholes are more of the same

*Mr. Theo. H. Scheffer has here set down certain facts, concerning the waters of the Grand Coulee and the aquatic plants found therein, which should prove of historic value to future students of taxonomy and ecology, since the whole area will be inundated as Coulee Dam reaches completion.

thing—or less. Soap Lake and the part of Lenore Lake west of the highway are too alkaline for plant life. Their shores are fantastic with drifts of suds when the wind is in the right quarter. And their waters teem with larvae and pupae of brine-flies (*Ephydriahians*), seasoned to the taste of early-day Indians.

Directly below Dry Falls is a small lake occupying a plunge hole of the former cataract and expanding below it into a swamp. A rock, designated generally as the Battleship, once split the falls. It now isolates two or three smaller lakes—Perch Lake, Alkali Lake; and farther up this side coulee, to the east, is a lapful of water in the gorge, known as Deep Lake. These waters, together with the channels which connect them and discharge into Park Lake, support a considerable variety of aquatic plants. Deep Lake itself, however, is just that—with no shore shelf to support plants. The only other lake of any importance so far not listed is the misnamed Devil's Lake of the upper Coulee, set like a gem in a cirque of the basalt. It will disappear with the construction of the equalizing reservoir, leaving at its foot an island monument now known as Steamboat Rock.

As justification for this bit of research, it seems worthwhile to record the aquatic plant life, as some others have undertaken to make note of mammal species and other biological features. In time there will be a new and rearranged ecology of the Grand Coulee with man's creative energy the disturbing factor. At the outset we did not expect to find anything rare or endemic in aquatic plant life of the Coulee. For this mighty gorge, deep-channeled and withdrawn as it is, does not act to isolate species which may migrate with the rills or which are brought in from afar with the mud on a mudhen's foot. We present here, then, the list as representative of the aquatic species of the Coulee's flora; native, except for three or four forms which may have been introduced through man's occupations:

Annotated List of Aquatic Plants

1. Stonewort, Muskgrass (*Chara vulgaris*). Common, sometimes forming a dense car-

pet on the bottom of the hard-water lakes and ponds.

2. Liverwort (*Ricciocarpus vulgaris*). Noted only in the small spring run from Falls Lake.
3. Braun's Scouring-rush (*Equisetum laevigatum*). Noted occasionally, not common.
4. Cattail (*Typha latifolia*). Dense in a few swampy spots, usually in a mixed stand with tule or reed; not dominant anywhere.
5. Sago Pondweed (*Potamogeton pectinatus*). Common to abundant in several of the lakes; seeding heavily where competition is not too strong.
6. Small Pondweed (*Potamogeton pusillus*). Fairly common but nowhere inclining to dominance.
7. Horned Pondweed (*Zannichellia palustris*). Occasional in ditches; more abundant in one spring-fed pond.
8. Ditch Grass, Widgeon Grass (*Ruppia maritima*). Noted as abundant in upper Lenore Lake and in Falls Lake.
9. Water Plantain (*Alisma Plantago-aquatica*). Quite common in swamps and along ditches and water courses.
10. Arrowhead, Wapato (*Sagittaria latifolia*). Scant; observed only in two spring-fed lakes; grazed where accessible.
11. Wild Celery (*Vallisneria americana*). Noted only in one situation—a ditch below a swamp in the Deep Lake outlet. Probably introduced.
12. Common Reed (*Phragmites communis*). Common to abundant about Falls Lake and Perch Lake; of scattered occurrence elsewhere.
13. Wild Millet (*Echinochloa Crus-galli*). Occasional where not grazed.
14. Beard Grass (*Polypogon monspeliensis*). Common in moist situations about the lakes and runs.
15. Narrow-spiked Reedgrass (*Calamagrostis inexpansa*). Common but not abundant anywhere.
16. Reed Canary-grass (*Phalaris arundinacea*). Noted here and there, but not common; probably grazed where accessible.
17. Alkali Cord-grass (*Spartina gracilis*).

- Fairly common; observed at two lakes and about two spring runs.
18. Redtop (*Agrostis palustris*). Common where not too closely grazed (in shallow water).
 19. Saltgrass (*Distichlis stricta*). Almost everywhere about the more alkaline lakes—to the water's edge and occasionally with long runners in the brackish water itself.
 20. Creeping Spikerush (*Eleocharis palustris*). Common about the fresher lakes and ditches; major and minor forms recognized.
 21. Beaked Spikerush (*Eleocharis rostellata*). Patches along Blue and Park Lakes.
 22. Soft-stemmed Spikerush (*Eleocharis macroura*). Collected at Blue Lake and Falls Lake.
 23. Marsh Bulrush (*Scirpus paludosus*). Common along several of the lakes and ditches and at Coulee City springs.
 24. Great Bulrush (*Scirpus validus*). Heavy stands in coves of the fresher lakes, more sparsely represented about the alkaline.
 25. Nevada Club-rush (*Scirpus nevadensis*). Common about the more alkaline lakes, usually in a mixed stand with Saltgrass.
 26. Three-square (*Scirpus americanus*). Occasional dense patch but sparsely represented in most situations, often dwarfed.
 27. Woolly Sedge (*Carex lanuginosa*). Scant occurrence on shores and in the edge of the swamps; grazed.
 28. Clustered Field Sedge (*Carex praegracilis*). Scant occurrence about Blue Lake, Forbidden Springs, Coulee City spring runs.
 29. Nebraska Sedge (*Carex nebrascensis*). Noted along springs runs, usually much grazed.
 30. Lesser Duckweed (*Lemna minor*). Common in quiet pools, not particularly abundant anywhere.
 31. Ivy-leaved Duckweed (*Lemna trisulca*). Occasional in ponds and ditches.
 32. Torrey's Rush (*Juncus torreyi*). Occasional along the spring runs, common on shores of Blue and Park Lakes.
 33. Baltic Rush (*Juncus balticus*). In small to larger and dense patches about the fresher waters.
 34. Common Toad Rush (*Juncus bufonius*). Collected only at the south shore of Soap Lake.
 35. Dudley's Rush (*Juncus dudleyi*). Noted occasionally along runs and ditches.
 36. Spikenard (*Smilacina stellata*). Two small patches noted—one at Forbidden Springs, one at spring in Barker Canyon.
 37. Western Iris (*Iris missouriensis*). Noted as common along run from Northrup Canyon to Devil's Lake.
 38. Water Persicaria (*Polygonum natans*). Here and there in the fresher ditches and ponds but not anywhere abundant.
 39. Dock-leaved Persicaria (*Polygonum lapathifolium*). Noted here and there about Devil's Lake.
 40. Lady's Thumb (*Polygonum Persicaria*). Occasional, and dense stand in dry lake bed of Dry Falls coulee. Species may have been introduced.
 41. Seaside Dock (*Rumex maritimus* var. *fueginus*). Noted as common in the swampy ground at Devil's Lake.
 42. Curly-leaved Dock (*Rumex crispus*). Collected at pond, Coulee City. Occasionally noted elsewhere.
 43. Seaside Buttercup (*Ranunculus Cymbalaria* var. *saximontanus*). Common in wet ground, particularly in Falls' coulee.
 44. White Water-buttercup (*Ranunculus trichophyllus*). Here and there in fresh ponds and runs, occasionally abundant.
 45. Water Cress (*Nasturtium officinale*). Observed only in Park Lake at the entrance of small stream from Falls' coulee.
 46. Silver Weed (*Potentilla Anserina*). Common in the wet ground along the runs and about the lakes.
 47. Western St. John's Wort (*Hypericum Scouleri*). Collected only at two or three small springs along the Coulee walls.
 48. Willow Herb (*Epilobium glandulosum* var. *adenocaulon*). Common locally.
 49. Mare's-tail (*Hippurus vulgaris*). Noted only in the swamp below Falls Lake.

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Making Dahlias Grow

PLINY L. ALLEN*

BY the time this issue of THE BULLETIN reaches you, most of the dahlia gardens will have been planted and many lovers of the home garden, and particularly those interested in dahlias, will be found watching the hills to see the break in the soil which precedes the appearance of the tender shoots that grow into sturdy stems and may support a tiny pompon, or a dainty miniature, or a giant, 12-inch bloom worthy of a blue ribbon in any dahlia show.

No time should be lost in the care and cultivation of these early shoots. Loosen the soil around them and as they grow fill up the hollow around them until the soil is level with the ground.

The number of shoots permitted to grow and bloom will depend upon the ultimate purposes of the garden. If for cut flowers and lots of color, let as many stalks grow as you wish; this will apply to all varieties. For display and show purposes, the large varieties (8 inches and larger) should not be permitted to mature more than four stalks; some growers permit only two stalks, each with two flowers —four blooms to the plant. This feature will be covered later in the article.

Fertilization

If former suggestions have been carried out: *i.e.*, ground well prepared, with a proper amount of humus, care taken to have reasonable slope for drainage and a small handful of raw bone meal mixed with the soil in the bottom of the hole before planting, little or no fertilizer need be applied for the first four weeks of growth.

At the end of that period a small amount, possibly one-fourth of a cup, of a complete commercial fertilizer scattered around each hill at a distance of 10 inches from the stalk, raked and well watered in, will furnish plant food for the next three weeks. This program may be repeated once or twice more during the season and should insure a wealth of beauty and bloom, satisfying to the flower

lover who grows dahlias and other flowers for the sheer joy of making a contribution to the happiness and pleasure of those who are fortunate enough to witness the results of his painstaking labor.

Irrigation

Water—as necessary as fertilizer—should be liberally supplied to the plants during the growing season. *Dahlias love water.* The plants never should be permitted to dry out. Some growers prefer to use high sprinklers and soak the leaves and stalks as well as the ground around them, carrying on this program until the blooms are near bursting. My personal preference is for generous irrigation around the roots of the plants, seeing to it that the soil is loose enough so that the water soaks readily into the ground. As the season for full blooming approaches (our hottest and driest days), these soaking irrigations should be weekly *musts*—grateful plants will reward you with beautiful flowers.

Insect Pests

Dahlia growers in the Pacific Northwest are extremely fortunate in that the number of insect pests which threaten the plants and inflict damage to their full blown flowers is few in comparison with similar annoyances which beset less fortunate growers in other parts of our country. One East Coast dahlia enthusiast, recounting pest troubles, has spoken of midnight visits to his gardens, where with a flashlight and tweezers he picked from his prize blooms beetles and bugs unknown to the Pacific Northwest and which, if left to their own devices, would in a few hours render worthless the flowers on which the grower had showered the attention and care almost equal to that given a child.

Aphids, sucking insects, the most common pests, which appear early on the young plants, are easily controlled by spraying with a nicotine or pyrethrum solution applied at frequent intervals. Many preparations for the control of aphid are on the market and, if used according to directions, will clean affected plants and stop the spread of the pests.

*This is another in the series of articles by Mr. Pliny L. Allen, one of the Puget Sound region's best-known personalities and the leading dahlia grower of the section.

Leaf hoppers are probably the worst pests with which we have to deal. They are chewing insects, multiply quickly and, if not controlled will eat holes in the leaves of the plants and in the petals of the flowers, disfiguring foliage and causing damage to blooms which renders them unsightly, not satisfactory as cut flowers, and spoils them for exhibition purposes.

Insecticides for the extermination of leaf hoppers and other chewing insect pests are available and should be sprayed or dusted on the plants according to the direction for their use as printed on their labels. "DDT", the most recent chemical development for the control of insect pests, including leaf hoppers, is now undergoing further tests, and promises soon to be on the market in dust form for this purpose.

Earwigs, once a problem to the writer in his dahlia gardens, have in recent years been kept under control by a half dozen bantam hens captained by "Tony," as proud a little officer as ever wore a red-breasted uniform—all of them making war on Mr. Earwig, who has practically disappeared. "DDT" also is a good earwig exterminator.

Mosaic is not an insect pest, but a virus disease which affects dahlias and some other tuberous and bulbous ornamental or flowering plants. It has appeared in the gardens of growers in different parts of the United States. The presence of this virus, which causes a mottled, yellowish condition of the leaves of the plant, means that the tubers of the particular plant will carry the disease to future plantings and that insects, particularly leaf hoppers and thrips, may carry the virus from the infected plants to healthy dahlias and to certain vegetable crops, notably tomatoes. This situation is causing much concern among federal and state plant pathologists. It is recommended that any plant obviously affected with virus be dug up and burned, every bit of it, the tubers and the stems and the leaves.

Exhibition Dahlias

While the foregoing suggestions are meant to apply to dahlias grown for cut flowers and for general beauty in the garden, they apply also up to a certain point to the raising of

dahlias for exhibition or show purposes.

The enthusiastic grower is probably a member of one of the dahlia societies in the Pacific Northwest, which holds an annual show at which members, friends and friendly enemies strive to outdo each other in the perfection and minuteness of their pompons, or the giant size, brilliant colorings and depth of their cactus, semi-cactus, formal, or informal decorative blooms 12 to 15 inches in diameter.

Keen competition among exhibitors at these shows has brought about growing methods and techniques designed to produce blooms that will rate blue ribbons in such competition.

In the pompon, miniature, ball, and single classifications, little special effort is put forth. The plants are kept free from pests, well watered, properly fertilized and not too many shoots permitted to mature in a hill. This kind of treatment will produce perfect blooms of normal size and should bring to the exhibitor his share of ribbons in these classes. A possible exception to the above is in the pompon class. Some judges give preference to the smallest flowers of a given variety. Smallness in pompon flowers is secured by *starving* the plants. Little water, no fertilization, no shade, and less attention will produce *small* flowers. But *perfect* blooms are hard to find when above methods are used. I don't recommend the practice.

Large flowered varieties receive, in the main, the same treatment recommended above in this article, with a few additional and extra quirks designed to make the flowers larger, the foliage greener, and the stalks sturdier so that blooms may hold their heads up and at such an angle that judges, exhibitors and the public may look into their faces and view the ultimate in prize-winning dahlia blooms.

When the plant is four to six inches high the center of *two* healthy sprouts is pinched out just above a node. Most or all other sprouts are destroyed and from the two pinched out, four shoots will grow. These are the shoots that will give you the big blooms. As the shoots grow, all side branches should be pinched out and all buds with the exception of the center one at the top of the stalk

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Rock Gardening With Native Alpines

ROSS AND LEOTA GILL*

WITH the world's finest wild alpine gardens near at hand, rock gardeners in the Puget Sound area do not have to limit themselves to the ordinary standardized plant material. Rock gardening with our native alpines can put some real adventure into an otherwise rather vegetative avocation. Many discouraging pages have been written about lifting high altitude plants and then trying to get them to grow and bloom in sea level locations. Some wildlings do resist captivity most wholeheartedly but many charming species can be moved into the average rock garden and induced to live out their normal spans of life, and to bloom beautifully. In order to minimize disheartening failures one should know which plants take to moving and where to look for these species. In case you are not exactly up on your alpines, the speediest way to learn might be to invite a botanist, professional or amateur, to show you around at six thousand feet. The lure of a summer day in the high country with some little added attraction, such as a basket of fried chicken, should turn the trick. Once you have met the penstemon family, the saxifrages, and all their elegant neighbors, you can take to the hills thereafter with a reasonable amount of self-assurance. First of all, the collector should inform himself in regard to the boundaries of national parks, monuments, and state parks, which are out of bounds for plant collecting.

In the way of tools you will need a husky, over-sized trowel, pruning shears, and something to pry rocks apart. For this, a small geologist's pick-hammer or a small pinch bar will do the work. For packaging your plants, carry along a bundle of newspapers and a ball of string. A canteen of water will save much climbing about in search of a stream. Your tools and papers in a rather capacious knapsack and you are ready for the heights.

*Ross Gill, the artist, needs no introduction, for he is well known to all in the Pacific Northwest. His avocations are color photography and collecting alpine plants. This latter field, as in the accompanying article, he shares with Mrs. Gill, who studied landscape architecture at University of Illinois, and the results of their combined talents and interests make their studio-home and its surrounding gardens near Bothell a charming and colorful spot.

The skillful lifting of the plant is the most important operation involved. No matter how you covet the big ones, your best chances of success lie in selecting small specimens. Select a plant in a steeply sloping location where the soil is loose or one whose roots can be removed intact by dislodging a few rocks. Getting all the roots, including the fine hair-roots, is most important. Spread the uprooted plant out flat on a square of your newspaper two or three sheets thick. Dribble a little water over the roots. Next, fold the paper along the side, over and over until you have a neat, tight bundle open at the top, and tie it firmly. Your plant bundles will carry best standing on the closed root-ends in your knapsack and don't forget to dribble a little water in the open tops occasionally. If your memory is faulty better write down a little data including such details as full sun or part shade, type of soil, rocks, and location, whether moist or dry, and insert in your bundle. Unless you happen to be a soil expert better scoop up enough soil in which to replant your specimen at home, being careful to include the gravels and small stone chips. This can be packed up in stout paper bags. Good alpine manners require that you always tidy up the scene of the crime by replacing your divots. When you begin to stagger under the weight of the bundles of plants and soil, you can call it a day for collecting. You may not have many plants but you may be reasonably well assured of getting them to grow and bloom.

When the plants are finally installed in your rock garden as nearly as possible like you found them on the mountainside, snip off the bloom stalks, if any, and shade them from the hot sun for a few days. Most alpines resent any fertilizers other than finely sifted leaf mold, and they want only light watering after the blooming season. Perfect drainage is essential which means that liberal quantities of gravelly sand and stone particles must be mixed with the soil in planting. Along most mountain roads small boulders of disintegrating granite can be found which will stow

easily in the car and which will help to solve the drainage problem.

First in the category of showiest and easiest to grow among our wild alpines are the penstemons. They range in size from the pygmy *P. humilis*, in prostrate evergreen mats, up to *P. fruticosus*, a shrubby variety which will grow to four feet in diameter and two feet in height. In the higher altitudes the more diminutive and sprawling varieties are found. Such types as *P. Menziesii* and other dwarfs could be reserved for the miniature section of your alpine garden. Perhaps the showiest of this family, which runs mostly to the brilliant blues and lilac colors, is *P. rupicola*, the flaming crimson-flowered one found mostly on sheer cliffs. You may have to risk your neck to get one though seedlings may sometimes be found at the foot of a cliff far below their giddy parents. The penstemons should be laid down with flat rocks over their roots in the sunniest part of your garden, and the mat varieties like to drape out over rocks or hang from a crevice.

While you are in very high territory you might take some of the prostrate alpine willows. *Salix nivalis* and *S. cascadiensis* are miniatures and easily moved. The stems of the older plants are orange yellow and they bloom in early spring at sea level. Around tree line you will find many delightfully dwarfed specimens of various trees such as *amabilis* fir, white-barked pine, and junipers. Given spartan treatment in rocky ledges in your garden they will retain their windswept shapes quite indefinitely. The mountain or black hemlock dwarfs are probably the easiest to move. They can be found in fanciful shapes down to bilowy mats of blue green that take on a silvery sheen in winter. If any of them suddenly decides to become an upright tree after a few seasons in your garden snip off the aspiring stalks well down in the clump. It will send out more lateral plumes and forget the tree idea for a few more years. The creeping *Juniperus sibirica* is on the difficult side. Rooted sections, not too large, planted in mountain peat-soil with rocks over the roots should be successful. It will take part shade and more moisture. *Cassiope Mertensiana*, the lovely white heather, is successful if taken up in

small sods of the mountain peat in which it grows. The so-called pine heather, *Phyllodoce empetriformis*, can also be moved in sods. Both like more moisture than the rock plants and both require partly shaded locations. For these heathers, and any other peat-loving alpines you may collect, dig a burlap bagful of mountain peat. Don't expect the commercial peat moss in bales to work. It won't. *Gentiana calycosa* likes moisture and sun. Sifted in a deep sod and planted in a bed of mountain peat it will put out its deep blue flowers in May at sea level instead of in August at 6000 feet where it is usually found. Some sods of the little golden *Potentilla flabellifolia* make a good combination for the gentian. After blooming, only light watering is needed for both of these.

Douglasia laevigata grows in protected scree at 6500 to 7000 feet, usually in the part-shade of a rock. In your garden it will be a fist-sized, compact mound of green, moss-like, foliage thickly starred with bright crimson flowers in early March. Keep it covered during the winter rains with a pane of glass. New plants are easily propagated by division like the mossy saxifrages.

The saxifrages like the company of small ferns such as the spleenwort. They make good backgrounds for tiny plants or, hanging out of crevices, their airy scapes of creamy white flowers suggest mist from a waterfall. The evergreen leaves of varieties from low levels turn to brilliant purples and reds in winter.

A sensational plant for your garden, providing the scale is large, is *Xerophyllum tenax*, commonly and variously called bear grass, squaw grass, or basket grass. Take it up in deep sods. The heads of creamy flowers in fantastic shapes rise on stalks as high as three feet. They are highly fragrant and bloom faithfully in May in the garden. While the alliums, brodieas, fritillarias, and others of the lily family are not exactly alpines they are most appropriate in a rock garden and add color and interest to it in early spring. Most of them are found on the dry side of the Cascades at 2000 feet and lower. The little yellow erythronium from about 2000 feet transplants

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Kinds of Peat

GEORGE B. RIGG*

LARGE amounts of peat and peat moss are found in bogs in many parts of Western Washington, Oregon, and British Columbia. So many roads have been built in recent years that most of these deposits can now be reached.

There is a steady interest in the kinds of peat available and the names and descriptive terms that apply to them. Producers, dealers and users are all interested. Requests for information come mostly from west of the Cascades, but occasionally one comes from east of the mountains and even from eastern and southern states. A recent one from the southeast asks that the samples sent be classified on the von Post scale. This scale has been used by those who have made investigations on peat in Europe and America ever since it was published in 1924. It was contained in the report of an international committee published in Helsingfors (Helsinki), Finland.

The scale classifies peat on the basis of the degree of disintegration or "humification" of the plants from which the peat is formed. It is a definite, simple scale. The test for determining where a sample of peat ranks on this scale is easily made since it does not involve the use of a microscope, and all that the person making the test needs is his hands and his eyes. The test is made by pressing a convenient quantity of peat in the hand and observing what comes out between the fingers and what remains in the hand. The material that comes out between the fingers may be water or very wet solid material or even slimy semi-solid material. If it is water it may be clear and colorless or it may have a yellowish or brownish color or it may even be quite turbid. The solid material usually has the general appearance of mud, though it is quite

different from mud made by wetting ordinary soil and may be somewhat slimy. It has been formed by the complete or partial disintegration or even decay of the remains of the plants from which the peat originated. Where the term "plant structure" is used in the classes of peat on the von Post scale, it refers to stems, leaves, or roots or pieces of them that can be recognized as such without the aid of a microscope.

The following is a translation from the German in which the characterization of the ten classes of peat was published:

1. Not at all disintegrated; contains no mud; when squeezed in the hand nothing but clear, colorless water comes out between the fingers.
2. Almost no disintegration; almost no mud; when pressed in the hand nothing but almost clear or slightly yellowish-brown water comes out between the fingers.
3. Very slightly disintegrated; very little mud; nothing but somewhat turbid water comes out between the fingers; the residue remaining in the hand is not pulpy.
4. Slightly disintegrated or containing some mud; nothing but decidedly turbid water comes out between the fingers; the residue in the hand is somewhat pulpy.
5. Moderately disintegrated or containing a moderate amount of muddy material; some peat substance and brown muddy water pass out between the fingers; the portion remaining in the hand is decidedly pulpy.
6. Moderately disintegrated or containing a moderate amount of muddy material; perhaps half of the peat substance passes out between the fingers; the portion remaining in the hand is distinctly pulpy but shows evident plant structure as in the unpressed peat.
7. Much disintegrated or containing a large amount of muddy material in which some plant structure can still be recognized;

*Dr. George B. Rigg of the Department of Botany at the University of Washington, has spent years studying the peats that are so characteristically prevalent in the bogs of the Northwest. His published contributions to the knowledge of this section of botany have brought him national repute. We are pleased to carry the latest work in which he has set forth the characteristics of the many kinds of peat which are available for garden use.

The extensive and increasing use of peats in horticulture makes it the more desirable that those who use them have a full understanding of the differences in quality.

- about half of the peat substance passes out between the fingers.
8. Very much disintegrated or containing a very large amount of muddy material in which very little plant structure is recognizable; about two-thirds of the material passes out between the fingers; the portion remaining in the hand consists mainly of the more resistant constituents such as fine roots, pieces of wood and the like.
 9. Almost completely disintegrated or consisting almost entirely of muddy material containing almost no recognizable plant structure; almost the entire mass passes out between the fingers.
 10. Completely disintegrated or consisting entirely of muddy material without any recognizable plant structure; the entire mass passes out between the fingers.

This test is designed for use on peat fresh from the bog. Peat sold on the market has, of course, dried out during processing and handling to such an extent that water cannot usually be pressed out of it. A fairly good test may be made, however, by moistening the sample.

Other characteristics of peat which form a useful basis for classification or description are (1) the plant remains recognizable in it, (2) the moisture content, (3) the color, and (4) the acidity.

The plants from which the peat has been formed impart important properties or characteristics to it. A long period of time has, of course, been involved in the formation of any peat deposit. The bogs of the Puget Sound region are postglacial, and the geologists tell us that 10,000 to 20,000 years have elapsed since the retreat of the Vashon glacier, which was the last ice sheet to cover this region. The two kinds of peat most commonly known in the Puget Sound region are moss (*Sphagnum*) peat and sedge peat. These two kinds of peat are also common in many other portions of the United States, and in Canada. Most of the bogs of the Puget Sound region have a layer of moss peat at the surface, though some have no moss peat and have a layer of sedge peat at the surface. The moss layer in our bogs

may vary in thickness from one to ten feet. Where the layer is several feet thick it may consist of two layers, the upper one ranking from 1 to 4 on the von Post scale and the lower one from 5 to 10. In these cases the upper layer usually consists of whole leafy stems of sphagnum moss while the lower layer is very watery and consists largely of separate leaves of sphagnum and pieces of the stems from which they have come. Moss peat in many bogs is mixed more or less with the upper portion of the layer of sedge peat which lies under it.

The layer of sedge peat underlying the moss peat may be several feet in thickness. The sedges from which it has mainly originated are grass-like plants and, if disintegration has not gone too far, their leaves, stems, and even roots may be recognizable with the unaided eye. Their cellular structure is often recognizable under the microscope. Both moss peat and sedge peat are commonly sold from bogs, though the term sedge peat has not yet become well established among dealers and users. There is a tendency to include all peat that is not readily recognized as moss peat under the general term humus. This is a safe term, but the use of the term sedge peat would be useful if its qualities and properties were more definitely known to producers, dealers, and users. Those who know this peat often buy it for certain purposes rather than moss peat or humus or mere "black dirt."

Underlying the sedge peat in most of the deeper bogs of the North Pacific coast is a material known to peat investigators as sedimentary peat. This has been formed mainly from plants and animals whose mature individuals were of microscopic size. They grew in enormous numbers in the water of the lake on which the bog was formed and settled to the bottom when they died. Sedimentary is sometimes mixed with sedge peat in getting the latter out of bogs by the use of machinery and does not seem to show any undesirable qualities. It would undoubtedly be useful if it could be made available. The difficulty in producing it is that when the moss peat and sedge peat are removed the sedimentary peat

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The Arboretum Bulletin

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Editor.....JOHN H. HANLEY

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OFFICE HOURS
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Phone SEneca 0920

Special Notice

To keep memberships in the Arboretum Foundation in good standing, dues should be paid during the month payable. Memberships more than three months in arrears will be dropped and the BULLETIN will be discontinued.

Arboretum Membership Blank

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516 Medical Arts Building
Seattle 1, Washington

I hereby apply for membership in the Arboretum Foundation and remittance for same is enclosed to cover dues for the next succeeding 12 months.

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All memberships are non-assessable.

*Garden Clubs—Affiliated membership \$10.00 minimum.
Special rate privileges to members of Affiliated Garden Clubs and Arboretum Units.

The schedule listed above has the following exceptions:

- a. That members of Garden Clubs, affiliated with the Arboretum and having membership of not less than \$10.00, shall be entitled to a \$2.00 or Associate membership.
- b. That members of Arboretum Units shall be entitled to a \$2.00 or Associate minimum membership.
- c. This schedule applies only to new memberships.

The Year in Review

THE appearance of the Summer, 1946, Bulletin marks the beginning of another year in the life of the Arboretum Foundation. It is well at this time to make note of the principal accomplishments of the twelve months just past.

The year ending May 31, 1946, has been one of general improvement and definite progress at the Arboretum. With the aid of an increased budget it was possible to add more workmen to the staff and to place at their disposal new items of machinery such as mowers, a cultivator, a tractor, and a new truck, with which they were able to make deeper inroads into many of the tasks of maintenance and development which had previously received scant attention.

In early 1945 it was becoming increasingly apparent that the areas bordering the full length of Lake Washington Boulevard needed attention. These are the areas which come most closely under the scrutiny of the majority of visitors to the Arboretum. However, since there had been no extensive plantings in them they had been largely neglected since mid-1941 in favor of Rhododendron Glen, Azalea Way and other sections wherein the plantings of ornamental trees and shrubs were more concentrated and more valuable. Thus there had grown up along the Boulevard many young stands of alder, cherry and willow saplings, and thickets of blackberry and elder-

NOTICE TO RHODODENDRON HANDBOOK SUBSCRIBERS

Many orders for "THE HANDBOOK OF RHODODENDRONS" have been received with which remittances did not include the 3 per cent sales tax. Please forward stamps to cover this tax to The Arboretum Foundation, 516 Medical Arts Building, Seattle 1. To those who live in the State of Washington and have not yet subscribed to The Handbook, be sure to remit the sales tax (3 per cent) with your order.

berry. Not only were these growths most unattractive, but they also obscured the important vistas to the more beautiful interior tracts.

For these reasons, extensive clearing operations were begun in August and were continued at intervals into March, 1946, with the result that the whole length of the Boulevard, from end to end, has been greatly improved in appearance. The operation has also assured easier maintenance for the coming seasons.

Along with the Boulevard clearing, the staff also carried on three other winter projects, namely, the preparation of soil in those field sections into which the large nursery stock was to be planted, the actual out-planting of the trees and shrubs, and the mulching of the newly-made beds with leaves.

Soil preparation in the field has always been, and will continue to be, the chief obstacle to rapid transplantation of stock from the nursery. The reason is not far to seek. It lies chiefly in the fact that such preparation must be done by hand on the majority of planting sites. In only a few areas where slopes are not too severe, and where there are no complications from tree roots, can the original work be done by machine.

Though soil preparation was slow and though the staff was carrying the other above-mentioned responsibilities, we were able to plant 5,000 trees and shrubs into their permanent positions.

Ordinarily the planting season is stretched out as long as possible that we may be enabled to plant out more and more of the trees and shrubs from the nursery. Thus we usually have continued out-planting operations through the month of April and have reserved the month of May for (1) preparing the nursery for the summer, (2) for removing the scars of the winter's digging operations in it and (3) for transplanting to the nursery rows any young material which has outgrown the greenhouses, lathhouses or cold frames in which it has been growing.

In years past, as a result of this program, we have found it impossible to keep up with the lush growth of weeds and grasses during March, April, May and June.

In order to obviate the condition for 1946 it was decided in mid-March that all out-planting would immediately stop, that we would proceed at once to the mowing and that we would give especial attention to those beds for which no mulch of leaves had been provided during the winter.

This placed an extra burden on the nursery foreman since it required him to get the nursery into condition by re-handling unusual quantities of large plants. By dint of hard work and good organization of a small labor force, he has been able to proceed most satisfactorily.

In addition to carrying the load of clearing along the Boulevard, preparing soil for out-planting, and actually planting 5,000 trees and shrubs into permanent sites, we also concentrated to the fullest on the mulching of the shrub beds. The newly planted beds received priority. By collecting every available leaf on the Arboretum and by using approximately thirty-five additional loads delivered to us by the City Street Department, we were able to cover the soil on most of the new beds and to add a bit to a few of the old plantings.

This treatment will be continually expanded and, with increasing help from the city, we expect to have all beds under reasonably good control within another two years.

Acquisitions

No particular attempt has been made during the year to acquire more plants and, except for a few special groups, the same policy will be adhered to during the coming year. The explanation for this policy is easily understood from the fact that the greenhouses, lathhouses, cold frames and nursery rows are filled with stock which must be cared for and for which permanent planting sites must be developed.

Thus the year's acquisitions of plants have been confined largely to a few special groups, to a minimum of fortuitous purchases of needed types, and to a relatively small number of gifts.

Of tree and shrub species, only 1722 plants were acquired.

Insofar as seeds are concerned, the Arboretum took advantage of the offerings of several important arboreums and botanical gardens

to fill in several gaps in our collections. The following institutions were the chief foreign contributors:

Botanical Garden, Erevan, U.S.S.R.
Botanical Garden, University Asiae, Taschkent, U.S.S.R.
Dominion Arboretum, Ottawa, Canada.
Montreal Botanic Garden, Montreal, Canada.
National Botanic Gardens of South Africa, Kirstenbosch, Newlands, C. P.
Royal Botanic Gardens, Edinburgh, Scotland.
Royal Botanic Gardens, Kew, England.
University Botanical Gardens, Delft, Netherlands.

Of the total number of seed packets (860 of tree and shrub species) received during the year, 523 packets came from these foreign sources.

The staff of the Arboretum has been naturally drawn into an ever-increasing amount of public service work. Daily requests for assistance and information on a wide range of horticultural matters come in by phone and by mail.

Garden club groups ask to visit the Arboretum to tour the grounds in the company of a guide. This function is undertaken gladly with the full knowledge that, as such services increase, the public comes to know and to appreciate the Arboretum the more.

Requests come from garden clubs and civic groups for talks on the Arboretum and its work. This means of satisfying a demand and for publicizing our institution at the same time is another of our important responsibilities which we discharge in good spirit.

—JOHN H. HANLEY

1 1 1

Olympic Wild Flowers

(Continued from Page Four)

feature a few of the endemics of the Olympics by calling it "The Piper's Harebell." The first man to discover one of the Olympic endemics, plants native to the country and found here only, was the genial botanist L. F. Henderson, when in 1890, with two fellow Mazamas, he joined the turbulent and quarrelsome military exploring party of Lt. O'Neil into the

Olympics. Henderson dreamed, he confessed, of endemics, maybe even new genera, "peeping out from the crevices of every succeeding mass of rocks, smiling down upon me from every cliff, or being crushed by every other step upon those green, sunny banks, which always border perpetual snows." Henderson lost his dream, and nearly his life, retiring soon from the uncongenial party with only two of the twenty-two endemic plants and shrubs later found in the Olympics, one of those two the low white alpine spirea, *Spiraea Hendersonii*.

Only two per cent of the native Olympic flora are endemics, as compared with 40 per cent of endemics in California; but also as compared with one solitary endemic species in all of Britain, which is fifteen times the area of the Olympic Peninsula. Still there was something about these endemics that excited us. It was the strangeness and drama of their situation, crowded up to the ridges and heights of these isolated mountains by the Pleistocene glaciers that choked Puget Sound to the right of them and the Straits of Juan de Fuca to the front of them, and licked up the stream-beds around their bases like a bear after a man up a tree. Twenty thousand years ago they looked out over the blue and white wastes where once had grown warmth-loving hardwood trees. Summer after summer they dressed themselves briefly in their bright colors in the thin heat and light on the high crags, till at last the glaciers crawled off and left them, stranded, passive, still holding their ground, beautiful and persistent but with all the starch taken out of them now for traveling.

On Mt. Angeles itself, jutting out from Hurricane Ridge, Cris was sure we could find at least two photogenic endemics, the Piper's harebell⁴ and Flett's violet,⁵ and maybe even, on some high slope, the *Senecio Websteri*, found only in the whole world on Mt. Angeles. But the actual trip kept getting postponed because it was so inaccessible. It was a hot day the last of July when we finally drove up on top of Hurricane Ridge, parked our car in a dense clump of alpine fir, took cameras and knapsacks and started along the ridge that

4. *Campanula Piperi*.

5. *Viola Flettii*.

leads to the south side of Mt. Angeles.

The ground was splintered rock, dry and hot, but below us on the north side of the ridge the slopes were still green. Down there we saw a black bear grazing. Cris was a little worried by the heat. "I'm afraid we may have waited too late," he said. But around us there were still flowers—patches of big white harebells among extra big blue harebells.⁶ The Piper's harebell grew higher, Cris told me, among the crags. And there was as fine a stand of fireweed⁷ as I had ever seen in the high country, raising its rosy racemes knee-high among the silvery, battle-writhed skeletons of the ghost trees, one clump even growing inside the gray ring where the core of the ghost tree had disintegrated. These combinations of gray and rose delayed us to film them. An old gray-patched marmot stood on his hind legs to pull down the blue lupine sprays with his "hand" to where he could catch them in his mouth. From a log hidden by branches the observant dark eye of a bird, perhaps a lutescent warbler, moved to keep track of us. Where the ridge joined Mt. Angeles and the wind blew hard, it must have felt solid to a hawk that circled to study us as we crawled along; he let down his landing gear onto the wind. Higher we came to a shining black oxidized manganese rock with yellow sedum growing on it, back-lighted to radiance, and we stopped to film that.

We were getting pretty thirsty. We had brought no water. There are few canteen trails in the Olympics and this was one of them. Even the air smelled like the sage-brush country in the Arid Transition life-zone in eastern Washington, and it was from a sage-brush herb that the pungence came, patches of tall woolly-gray artemisia. Along the trail marched a dwarf migrant from California, the Indian paint-brush, like owl-clover.⁸ Straight up from the hot talus, without leaves, bristled the queer hairy yellow orobanche,⁹ a parasite here, perhaps, on the roots of the wild onion. It was an alpine "desert."

6. *Campanula rotundifolia*. The white variety is not given in George Neville Jones' "A Botanical Survey of the Olympic Peninsula, Washington."

7. *Epilobium latifolium*.

8. *Orthocarpus imbricatus*.

9. *Orobanche fasciculata*.

When we came out on top of the saddle near black basalt monasteries and cathedrals of the sky, jutting above blue-hazed Cox's Valley two thousand feet below, Cris was discouraged. In the crevices of the crags he had spotted Flett's violet spreading its reniform leaves, but of the flowers only wispy ghosts were left. Yet something about this high saddle was enchanting. The air was light and keen in spite of the sun. On the north side, talus slopes opened down, patched with snow banks and rosy dense handkerchiefs of douglasia. There was something infinitely expansive and light-hearted about these flowers flung out on the barren talus.

We filled our tin cups with snow and sat down to eat our lunch. Below us lay the flat coastal strip and, rising beyond it, the Straits of Juan de Fuca, circled from west to east by the blue plateau of Vancouver Island, the Selkirks of Canada, and the cone of Mt. Baker floating above the Cascades. Far below us the flat land lay forest green with patches of crop-pale farm land, like blotches of sunlight. Port Angeles was a shimmer to the westward. Eastward, Dungeness Spit crooked a half submerged finger through the blue of the Straits, outlining a peninsula of which half was dipped under blue water and only the shoreward base was filled with dark green land, edged by a motionless white scratch that was the surf. In the profound hot stillness came the jay-jay of nut-hatches and the hum of big wild bumblebees working on clumps of the heuchera¹⁰ that hung its lily-of-the-valley-like panicles a foot above the black talus.

Water slakes thirst better than snow, but we could hardly wait till a little thawed under the snow in our cups, and each half gurgle felt as if it hissed and evaporated when it struck the hot walls of our stomachs. Cris took a very dim view of our prospects for finding the endemics in flower. Presently we rose and shoveled along the talus toward the shaded crags. Then I saw something odd. Cris was ahead. "What's this?" I called. "I never saw any foliage like this before." From the talus rose a single dense plant a foot high, its thick dark leaves back-lighted. "Could it be," I

10. *Heuchera racemosa*.

almost stammered, "could it be *Senecio Websteri*?"

Cris with his tripod over his shoulder looked down at it. "That's it," he said. "That's *Senecio Websteri*." Other plants stood above and below us, each exotic and detached on the steep naked talus. "There are only these few plants of it in the whole world," he said. "A hundred of them altogether maybe. But it's useless to take a picture. The flowers are gone."

"Take it anyway," I urged. "They look so wild and strange." But Cris walked on. Then he stopped and began setting up his tripod. He had found one still in bloom. The flower was a big pale dandelion-looking thing, almost ivory colored, with scraggly edges, and that ethereal back-lighting lifting it out of this world.

We walked on, light-hearted now whether we found anything else or not. Then in the dark cool lee of a crag we came upon the Piper's harebell itself, in perfect bloom. Its wreaths of green followed the crevices of the crag, thickly starred with one of the loveliest flowers I had ever seen, wide open stars of a peculiar vivid light blue with an almost imperceptible hint of red that made its color very live. The filaments made a white star in its center.

The picture, "The Piper's Harebell" was set. We thought! When the processed film returned, we found the color was bleached out. That blue had fooled us. We had a new arctic-alpine life-zone picture last fall, but it was not "The Piper's Harebell."

In the middle of October after the first warning snows had come and gone, we made our final back-packing trip of the year into the high country beyond the trails, to retrieve a couple of down sleeping bags we had left not winter-cached, in Eleven Bull Basin, high on the slopes of the Bailey Range. It was sundown on the second day when we contoured at timber line into the basin. From the sun at our backs, toward the Pacific, level rays spread a transparent surface over the vast Hoh Valley far below, already dark. In the cold shadow on its far side rose the silent semi-circle of glaciers and peaks that join Mt. Olympus.

Into all this country no man-made trail led. Ahead of us the sweep of the mountainside glowed with huckleberry. The rose light from behind us intensified it and made it electric, as if the air itself were rosy light. We passed high promontories recently pawed by bulls and the tracks of many elk, but the animals were gone. The vast halls of the mountains were empty. The slight leaves of the alpine herbs hung wilted and yellow. Over all was a feeling of waiting, of intense expectancy.

1 1 1

Colorado Foothill Shrubs

(Continued from Page Seven)

Physocarpus intermedius is the common ninebark of gulch and canyon hillsides. It grows thriftily in soil or on scree-slides, but always where it has abundant moisture in the spring. It is usually only three or four feet tall, though it may sometimes reach a height of six feet. In June, numerous flat, terminal, flower-clusters make a striking display of white above its green leaves.

Crataegus occidentalis is a shrub or small tree found beside the water-courses of the plains and lower foothills. Ordinarily this hawthorn is ten or twelve feet tall, but it may reach a height of twenty feet. Several fragrant half-inch flowers make up each showy, white cluster. Later the color of the red fruit is added to the gorgeous plum-red and wine of its autumn foliage.

Rhus cismontana, the dwarf sumac, grows on sunny slopes. It is usually found in clumps or thickets, but nevertheless shows a sprawling habit of growth. An old plant three or four feet tall may be twice that wide. In mixed thickets it is forced to grow more erect. Where spring frosts spare the flowers, pyramidal clusters of reddish fruit crown the bushes in the fall even after the flaming leaves have fallen.

The Rocky Mountain form of Oregon grape goes by the familiar name of *Mahonia Aquifolium*, but is not our tall plant, being a foot or less in height. Leaves and fruit are similar to those of our plant. Dwarfs can hardly be attributed to the climate, for typical plants brought to Denver by a nurseryman continued to produce tall shoots.

ARBORETUM NOTEBOOK

This department is published for correspondence and pertinent comments by experienced growers on interesting plants and their culture. We solicit your questions but space limitation necessitates the publishing of only such answers as we deem of general interest.

Dear Editor:

In the June, 1944, issue of the ARBORETUM BULLETIN, there was an article by Mr. Harry W. Higman entitled "Where the Madrona Blooms." The trips made by Mr. Higman as so interestingly described therein are the sort of adventures our family has always delighted in, and it was with mingled pleasure and envy that I reread the article.

The Protection Island and Port Discovery trips of Mr. Higman were especially interesting to us for we have been going to Chevy Chase (formerly Saints' Rest) on Port Discovery, during the summer time, for nearly thirty years.

The sojourn of the Vancouver Expedition off Carr Point in Port Discovery always intrigued us, and years ago before any buildings were there, we hunted around all over the flat point, digging here and there for signs of "occupation," but of course found nothing. At what is now called Mill Point there was in former times a very tall rock at about high tide and according to the stories of the first settlers there were many names of members of Vancouver's ships' crews carved on the rock. This rock was broken up and used for riprap when the mill was built. Hours of study of the broken rock in the riprap wall also produced no names. Mrs. Delanty, who lived in one of the remaining dwellings connected with the old mill, was a storehouse of information of the early days of the region.

We often planned to make an excursion to Protection Island to see for ourselves this spot so enthusiastically written of by both Vancouver and Menzies, but just never did get to go out there.

In 1931 and '32 I spent several months around Tucson, Ariz., and became much interested in the cactus life of that region. I refreshed my memory as to the finding of a species of cactus by Menzies on Protection Island, where, as he wrote, "I was not a little surprised to meet with the cactus *Opuntia*

thus far to the Northward," and promised myself a hunt for the cactus on some trip to Port Discovery. But frankly, I was a bit skeptical as to any form of cactus being found not only "thus far to the Northward" but in such a wet climate and close to the ocean.

So one August day in 1934, our younger son and I hiked along the beach from Chevy Chase to Beckett Point, locally known as "The Point." Beckett Point is just inside Cape George, the easterly entrance cape to Port Discovery, and bears exactly S.S.E. from the center of Protection Island. It is a very dry point and in late summer the hogback above the sand spit is covered with long dry grass which the children when younger used as a toboggan slide. For hours Hugh and I hunted for cactus but no luck. Finally it was time to leave for Chevy, and Hugh said, "O.K., Dad, as soon as I take a slide down the slope." A third of the way up the bank I was switching the grass, still looking for cactus, as Hugh slid by me; and just below me, slowing down in a depression, he gave a yell, and jumped several feet in the air. Yes, he had landed squarely in a bed of cactus possibly 20 inches in diameter, made up of small joints ranging from two to six inches in height with rather a scrawny appearance on account of the small number of spines to a joint. But as Hugh will bear me out, the cactus was a good healthy specimen. We dug up a small patch of it and for several years kept it on our front porch.

When in Tucson I had become acquainted with Mr. A. A. Nichol of the University of Arizona who had charge of the Cactus gardens. In early 1935, on visiting Tucson again, I carried some of our Port Discovery cactus along and presented it to him together with a short description of its historic background. He was much interested in the fact that it was found on the coast so far north. I am enclosing herewith a letter from Mr. Nichol to me with notes on this species of cactus.

On a trip up the Cariboo Trail and over into the Thompson River district in British Columbia, we encountered acres of cacti in full bloom in June in the very dry region near the junction of the Thompson and Fraser Rivers. This cactus plant is much larger and hardier than that found at Port Discovery and undoubtedly is the *Opuntia polycantha* of the arid regions east of the Cascade and Coast Mountain ranges.

—GEORGE A. FERGUSON

Dear Mr. Ferguson:

Thanks so much for your kind and very interesting letter and the road map with its most intriguing notations. I am afraid now we will be unable to go to the Northwest, but if such a happy possibility should arise later, I will write you then. We have taken 101 from San Francisco as far as the Oregon state line and thoroughly enjoyed it, but at that time there was much unimproved road on the coast route in Oregon. If we do come, we shall certainly take this outside road.

The little cactus plant (which I still keep in my window) is *Opuntia fragilis*, family *Cactaceae*. I know no common name for it except prickly pear, which applies to many others. It should have a common name of its own as it is one of the three most widely scattered cacti in the United States: *O. fragilis* and *Opuntia polycantha* in the Rocky Mountain states and *Opuntia Opuntia* in the East. *O. polycantha*, which has larger points and many more spines, must also be found in your country in the sandy, drier soils. It is given as the most northern growing of all cacti, incorrectly named in the footnote, as *Opuntia polycantha* would be much more in evidence because of its larger size and abundance than *O. fragilis*.

If I do not see you this summer I am looking forward to seeing you some time soon again in Tucson.

A. A. NICHOL,
Asst. Range Ecologist,
University of Arizona.

* * *

Plant Identification

One of the intensely interesting bits of service which the Arboretum renders to the

public takes the form of identifying plant materials for gardeners who encounter odd types. For example, there was a recent request to name a plant (specimen enclosed) which had been grown from a seed taken from (of all places) a package of rice!

Requests for the names of plants are interestingly timed, too. For example, last mid-summer there came from a Seattle garden a flowering shoot of the climbing bleeding-heart, *Adlumia fungosa*. A few days later another sample of this rather attractive biennial arrived from an Auburn, Washington, gardener.

Then there was the case of the so-called hardy "African" lily, *Dracunculus vulgaris*, the large, purple-black, smelly, calla-lily relative, which bloomed plentifully in several Puget Sound gardens last summer. The first specimen was brought to the office by a picturesque, and very sweet, elderly lady who had carried it in her hands all through the long, hot, bus trip from Queen Anne Hill. From her description of the journey it must have been a bit unusual, due possibly to the fragrance of the bloom, a fragrance which Mr. Wilhelm Miller has described as somewhat "terrifying."

In a matter of days two more owners of *Dracunculus vulgaris* plants telephoned, not only to find out what they were, but one of them also wanted to know how to get rid of it!

From these particular requests, coupled with visits to two of the gardens, we learned something of the conditions under which *D. vulgaris* can be grown here. It apparently needs a warm site and does not require any out-of-the-ordinary supply of water, as one might suspect.

No summer season will fail to bring a regular quota of leaf and flower specimens of a most interesting wild-type nasturtium, *Tropaeolum speciosum*. This Chilean vine can be most attractive if allowed to clamber among and over the branches of open, sparse-foliaged shrubs.

If any of our readers has plants which are unknown, we urge you to mail samples to the Arboretum, University of Washington, for help in naming them.

—J. H. H.

The Names of Rhododendron Hybrids

We have received inquiries concerning variations such as color and leaf structure in hybrids of the same name, especially in the newer rhododendrons. Some of these are undoubtedly due to misunderstanding of the rules governing the naming of hybrids.

Under these rules, when a primary cross is once made and recorded, this name arbitrarily covers all future crosses of the same parentage. Since seedlings vary in many characteristics, it is easy to understand the differences which may occur. Outstanding plants are usually indicated by a varietal name, or the originator's name, such as *Loderi* var. *King George* or *Unique (Slocock)*. Such varieties can only be propagated from the original plant by vegetative processes (such as grafts, layering, etc.), and those not so propagated are obviously improperly named.

Likewise, this holds good in the case of plants which receive awards. Here it is the individual plant which receives the award rather than the cross. To secure an award plant, it must be ordered by using the award as a varietal name, such as *Bow Bells award of merit variety* or *Bow Bells (Rothschild var.)*.

Loderi is a good illustration. This is *Griffithianum* x *Fortunei* and all crosses of the same parentage are *Loderi*. Some may be inferior to the original cross, but others may be far better as in the case of *Loderi* var. *King George*, *Loderi* var. *Venus*, and others. With hybrids which have been in commerce for some time, this is not important to the amateur as plants are generally more easily and satisfactorily propagated by vegetative means than by seed, but with comparatively new hybrid plants, this distinction may aid you.

HERBERT G. IHRIG

1 1 1

Herbaceous Peonies

(Continued from Page Six)

Festiva Maxima, the early white with a fleck of red, originally introduced in 1851, is still a popular garden and cut-flower variety.

Flesh Double—Baroness Schroeder makes an excellent cut flower. It was originally intro-

duced in 1889 and is still one of the higher rated peonies. *Tourangelle* has weak stems but is considered worthwhile because of the delicate shading of its blossoms. *Alice Harding* is a reliable bloomer. *Lady Alexandra Duff* opens light pink but fades to a grand, large, impressive white.

Light Pink Double—*Hans P. Sass* is impressive in appearance and very highly rated. *Judge Berry*, which is an early blooming variety, is good for cutting, as is also the clear colored *Marietta Sisson*. *Nick Shaylor*, a hard variety to get but very much worth having, carries a high rating. *Mrs. F. D. Roosevelt* is richly colored and has petals that are large and rounded. *Reine Hortense*, an older variety introduced in 1857, is still a favorite with its mother-of-pearl color effect. *Therese*, one of the highest rated of all peonies, is always among the best and no variety has ever won more first prizes than *Myrtle Gentry*.

Dark Pink Double—*Mrs. Livingston Farrand* has blossoms with the purest pink color yet introduced. *Souv. de Louis Bigot* is always popular for its shadings of pink, and for its yellow-stamened center. *Blanche King* is an intense pure color.

Medium Pink Double—The variety *Martha Bulloch* will always be near the top of any list because of the beauty and fragrance of its blossoms. *Mons. Jules Elie* is a larger, chrysanthemum-flowered type that is very popular, though introduced as long ago as 1888. *Walter Faxon* has smaller blooms but prolifically produced on well established clumps. We have had as many as fifty blooms on one plant.

Red Double—*Richard Carvel* is large and early. *Philippe Rivoire* has especially fragrant blossoms. *Sam Donaldson* is very new, and outstanding in color. *W. E. Blanchett* grows very tall, with loose blooms which are probably the largest of any peony yet introduced. The plant often grows to four feet in height.

Yellow and White Doubles—*Laura Dessert* and *Primvere* are recommended.

Japanese Type—This type is known for the brilliant petaloid center, which is in contrast to the stamen-filled center of the singles. Among the especially worthy varieties are

Rashoomon, rose-red; Isani Gidui, a pure white and probably the highest rated of any Japanese type; Toro-no-maki, also good in pure white; Tomate Boku which, in pink and yellow, is outstanding but hard to obtain in its true form; and Nippon Brilliant, an American origination in brilliant red.

If you do not have peonies in the garden, do try them. The beauty and satisfaction you will get from these delightful perennials will many times repay you for your original investment.

* * *

Grand Coulee Aquatic Plants

(Continued from Page Fifteen)

50. Water Milfoil (*Myriophyllum exalbescens*). Abundant in coves of the fresher lakes.
51. Water Parsnip (*Cicuta Douglasii*). Common but not anywhere plentiful.
52. Cut-leaved Water Parsnip (*Berula erecta*). Abundant in the runs and ditches of Falls' coulee.
53. Marsh Skullcap (*Scutellaria galericulata*). Along ditch of Falls' coulee and about Grove Springs in the upper Coulee.
54. Hairy Germander (*Teucrium occidentale*). Noted in a few locations, scarcely common.
55. Blue Vervain (*Verbena hastata*). Occasional patches along the spring runs.
56. Field Mint (*Mentha arvensis* var. *candensis*). Common but not abundant anywhere.
57. American Speedwell (*Veronica americana*). Collected in the ditch outlets of several springs.
58. Monkey Flower (*Mimulus guttatus*). Common along the fresh water courses and ponds.
59. Bladderwort (*Utricularia vulgaris*). Not common as observed; noted in Falls Lake and Perch Lake.
60. Stick-tight (*Bidens cernua*). Common about spring runs at Coulee City.

In concluding this discussion we may say that relative abundance of the several species of aquatic plants listed above exhibits the limiting factor of livestock grazing. The protected areas or the inaccessible spots will provide the taxonomic list—as of 1945.

Kinds of Peat

(Continued from Page Twenty-one)

is commonly covered with several feet of water. Drainage to get rid of the water would in most cases be expensive, and pumping without some provision for drainage is rather expensive and usually unsatisfactory.

Other plants from which peat in the vicinity of Seattle is formed are water lilies, scouring rushes (horsetails), and the trunks of trees and stems and leaves of shrubs. Some of our peat is also formed from mosses other than sphagnum. There is some mixture of these mosses with the sphagnum in a number of bogs near Seattle. These mosses do not have the large water-holding capacity that is characteristic of sphagnum moss. The peat that they form approaches the characteristics of sedge peat rather than the characteristics of sphagnum peat.

Among the other plants from which peat found elsewhere in the United States, Canada, Europe, and other parts of the world is formed are reeds, cotton grass, pondweeds, and arrow grass. Probably some of these may be found in bogs of the North Pacific coast also.

The moisture content of peat is also important. Some peat as it comes from the bogs contains relatively little water, while some of it is so watery that the plant remains are merely suspended in the water. The classification of peat on the basis of water content by von Post includes five classes (1) air dry (2) somewhat moist (3) normal water content (4) very watery (5) water with peat slime.

The color of peat or moss that is to be used as chicken litter, or as mulch or is to be spaded or ploughed into the soil, or used as a lawn dressing does not seem very important. The peat moss that is used to maintain moisture in asparagus crates is usually light brown in color. Color is more important for moss used by florists for maintaining moisture around cut flowers and choice plants in shipment. Some peat moss is almost white and is more attractive than the light brown, dark brown, or reddish moss. White moss is less common than darker colored moss and commands a higher price. It is obtained in commercial

quantities in Wisconsin and is also found to some extent in Washington and probably in other states.

Peat is usually acid. It was found by von Post that the acidity of peat is related to the degree of disintegration. Peat in which there was little or no disintegration was found to be very acid, and the acidity was found to decrease as disintegration progressed. Grade 10 on the von Post scale was almost neutral (neither acid nor alkaline). It has been demonstrated by several investigators that sphagnum moss, either living or dead, will cause water in which it is placed to become acid.

The acidity of peat (or any soil) is easily determined by anyone who is interested. A small testing outfit that has been found very satisfactory in use can be purchased for two or three dollars. The degree of acidity or alkalinity is determined by the color of a reagent, or indicator, after a few drops of it have been in contact with a very small quantity of the peat. Full directions and a color chart are furnished with the outfit.

* * *

Native Alpines

(Continued from Page Nineteen)

well. A drift of it, combined with the small, purple-flowered sisyrinchium in a sheltered nook, makes a thrilling sight and puts compatibles together for they both like to dry down after blooming. And *Erythronium giganteum*, with its handsome brown-spotted leaves and white, nodding, flowers rising in a little bower of delicate ferns, makes a picture of cool elegance. In spotted shade the white lady's-slipper with brown frills, *Cypripedium parviflorum*, along with *Claytonia sibirica*, the showy spring beauty, and clumps of our wild yellow violets, make a nice arrangement of plants easy to find and easy to grow. For full sun and part shade there is a host of colors in the dodecatheons, the perky little shooting-stars. Those from the driest locations seem to do the best.

Our wild irises from east of the Cascades come in varied hues of purples, pale lilac and silvery blues. They grow mostly in peaty soils. One from hillsides along the Pacific Coast is a dwarf with deep purple flowers.

The lewisiyas are the darlings of the alpine garden. *L. columbiana* is a tuft of straplike leaves. Its flowers appear in scapes of little, rose-pink, or white blooms. It likes to perch on top of rocks or hang out of rock crevices. A little patch of it on top of an ochre-colored rock is a nice thing to see. But *Lewisia Tweedyi*, a rich relative of *L. columbiana*, is the real dream flower of the alpines, though a bit difficult to keep. Its thick, tuberous roots must be bedded down in layers of rocks with the powdery leaf mold, granite sand, and decomposed pine needles in which it chooses to live in nature. Either planted in a wide fissure on top of a rock or hanging somewhat horizontally out of a rock crevice to insure the crown of the plant from rot in the wetness of winter is the best planting position. Those on top of the rocks should have the added protection of panes of glass through the winter. The roots should be kept cool in summer, *not* by much watering, however, but by the cast shadows of deciduous shrubby plants. Drainage must be absolutely perfect. Sounds like a finicky procedure but once you get *L. Tweedyi* planted right it grows into a large clump of lush, shiny, green with a veritable bride's bouquet of large waxy flowers in iridescent shades of shell-pink, apricot, and pale lemon yellow, all on the same plant. It makes a sight to thrill any alpine gardener's heart.

There are many more showy plants and shrubs for gardeners who would go alpine in a big way. To mention only a few, there are asters, erigerons and *Cornus canadensis*, the ground dogwood; mertensias, campanulas, the dwarf *Spiraea densiflora* with its corymbs of bright rose-colored flowers; and tiny kalmias, pyrolas and mountain huckleberry for masses of autumn color. Some of these have invading instincts but all are handsome plants for the garden large enough to accommodate them. And many, many more in our mountain highlands await future experimenters.

* * *

Visitors to Rhododendron Glen during the Rhododendron Show saw the Arboretum's collection of *R. Augustinii* at its full height of bloom.

Herbaceous Perennials for Central and Eastern Washington

STANLEY G. WADSWORTH*

THE flower gardeners of Central and Eastern Washington often express regret that many perennials cannot be grown in their gardens. One would gather from these expressions and from visits to average flower gardens that the number of perennials that may be grown here is very limited. However, when one actually examines the situation there is found to be little excuse for such statements. Below are listed some 95 genera of herbaceous perennials, including many more than 100 species, that may be grown with relative ease in these areas.

Perennials for Central and Eastern Washington

<i>Achillea Millefolium roseum</i>	Rosy Milfoil
" <i>Ptarmica</i>	Sneezewort
<i>Aconitum spp.</i>	Monkshood
<i>Aegopodium Podagraria</i>	Goutweed
<i>Ajuga reptans</i>	Bugle
<i>Althaea rosea</i>	Hollyhock
<i>Alyssum saxatile</i>	Goldentuft
<i>Anchusa italica</i>	Italian Borage
<i>Anemone Pulsatilla</i>	European Pasqueflower
<i>Anthemis tinctoria</i>	Camomile
<i>Aquilegia spp.</i>	Columbine
<i>Arabis alpina</i>	Rockcress
<i>Aruncus sylvester</i>	Goatsbeard
<i>Asclepias tuberosa</i>	Butterfly Weed
<i>Asperula odorata</i>	Sweet Woodruff
<i>Aster spp.</i>	Hardy Asters
<i>Astilbe hybrids</i>	Herbaceous Spirea
<i>Aubrieta deltoides</i>	Purple Rockcress
<i>Baptisia australis</i>	Wild Indigo
<i>Bellis perennis</i>	English Daisy
<i>Boltonia spp.</i>	False Starwort
<i>Brunnera macrophylla</i>	Siberian Bugloss
<i>Campanula carpatica</i>	Carpathian Harebell
" <i>persicifolia</i>	Peach Bells
" <i>Trachelium</i>	Coventry Bells
<i>Centaurea dealbata</i>	Persian Centaurea
" <i>Macrocephala</i>	Globe Centaurea
" <i>montana</i>	Mountain Bluet
<i>Centranthus ruber</i>	Red Valerian
<i>Cerastium tomentosum</i>	Snow-in-Summer
<i>Chelone glabra</i>	Turtlehead
<i>Chrysanthemum coccineum</i>	Pyrethrum
" <i>hortorum</i>	
Hardy Chrysanthemum
" <i>maximum</i>	Shasta Daisy
<i>Cimicifuga racemosa</i>	Cohosh Bugbane
<i>Coreopsis grandiflora</i>	Tickseed
<i>Corydalis spp.</i>	Corydalis

<i>Delphinium cardinale</i>	Cardinal Larkspur
" <i>grandiflorum</i>	Chinese Delphinium
" <i>hybridum</i>	Garden Delphinium
<i>Dianthus spp.</i>	Hardy Pinks
<i>Dicentra spp.</i>	Bleeding Heart
<i>Dictamnus albus</i>	Gas Plant
<i>Doronicum plantagineum</i>	Leopard's-bane
<i>Echinacea purpurea</i>	Purple Coneflower
<i>Echinops sphaerocephalus</i>	Globe Thistle
<i>Erigeron speciosus</i>	Fleabane
<i>Eryngium spp.</i>	Sea Holly
<i>Eupatorium spp.</i>	Thoroughwort
<i>Filipendula hexapetala</i>	Dropwort
" <i>Ulmaria</i>	Meadowsweet
<i>Gaillardia aristata</i>	Blanket Flower
<i>Geranium spp.</i>	Crane's-bill
<i>Geum chiloense</i>	Avens
<i>Gypsophila paniculata</i>	Babysbreath
" <i>repens</i>	Creeping Babysbreath
<i>Helenium autumnale</i>	Sneezeweed
<i>Helianthus mollis</i>	Ashy Sunflower
<i>Helleborus niger</i>	Christmas Rose
<i>Hemerocallis spp.</i>	Day Lily
<i>Hesperis matronalis</i>	Sweet Rocket
<i>Heuchera sanguinea</i>	Coral Bells
<i>Hibiscus Moscheutos</i>	Rose Mallow
<i>Hosta spp.</i>	Plantain Lily
<i>Iberis sempervirens</i>	Evergreen Candytuft
<i>Iris spp.</i>	Iris or Flag
<i>Liatris pycnostachya</i>	Gay-feather
<i>Limonium latifolium</i>	Sea Lavender
<i>Linaria macedonica</i>	Macedonian Toadflax
<i>Linum perenne</i>	Perennial Flax
<i>Lobelia cardinalis</i>	Cardinal Flower
<i>Lupinus polyphyllus</i>	Lupine
<i>Lychnis chalcedonica</i>	Maltese Cross
" <i>Coronaria</i>	Rose Campion
<i>Lysimachia spp.</i>	Loosestrife
<i>Lythrum Salicaria</i>	Purple Loosestrife
<i>Malva moschata</i>	Musk Mallow
<i>Mertensia spp.</i>	Bluebells
<i>Monarda didyma</i>	Bee Balm
" <i>fistulosa</i>	Wild Bergamot
<i>Myosotis scorpioides</i>	Marsh Forget-me-not
<i>Nepeta Mussinii</i>	Caucasian Catnip
<i>Oenothera fruticosa</i>	Evening Primrose
<i>Paeonia spp.</i>	Peony
<i>Papaver nudicaule</i>	Iceland Poppy
" <i>orientale</i>	Oriental Poppy
<i>Penstemon spp.</i>	Beardstongue
<i>Phlox spp.</i>	Hardy Phlox
<i>Physostegia virginiana</i>	False Dragonhead
<i>Platycodon grandiflorum</i>	Balloon Flower
<i>Polemonium caeruleum</i>	Jacob's-Ladder
" <i>reptans</i>	Creeping Polemonium
<i>Potentilla spp.</i>	Cinquefoil
<i>Primula spp.</i>	Primose
<i>Pulmonaria saccharata</i>	Lungwort
<i>Rudbeckia spp.</i>	Coneflower
<i>Saxifraga cordifolia</i>	Heartleaf Saxifrage
<i>Scabiosa caucasica</i>	Caucasian Scabiosa
<i>Sedum spp.</i>	Stonecrop
<i>Sempervivum spp.</i>	Houseleek
<i>Solidago spp.</i>	Goldenrod
<i>Stachys lanata</i>	Wooly Betony
<i>Statice Armeria</i>	Common Thrift
<i>Thalictrum spp.</i>	Meadow Rue

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<i>Thermopsis caroliniana</i>	Carolina Thermopsis
<i>Trillium spp.</i>	Trillium
<i>Trollius europaeus</i>	Globe Flower
<i>Valeriana officinalis</i>	Garden Heliotrope
<i>Veronica spp.</i>	Speedwell
<i>Viola spp.</i>	Violets

No indication has been given of seasonal bloom, flower color, texture, height, soil, moisture requirement or need of sun or shade. To present this material would make a very complicated table. Such information can be found easily once one knows the name of a plant. The following sources are suggested:

Cyclopedia of Horticulture, L. H. Bailey.

The Book of Perennials, A. C. Hottes.

The Garden Month by Month, M. C. Sedgwick.

Many other kinds of plants may be added to the above list by the experienced gardener willing to give special attention to them.

1 1 1

Camellias

(Continued from Page Twelve)

the slips will die; for this reason experience has shown the north exposure to be the best, provided that the ground is free from the roots of large trees which sap the moisture from the soil. A trench is dug about five feet long, two feet wide and at least eighteen inches deep. The soil removed is thrown on a canvas and, as in careful camellia planting, peat and sharp sand are added in equal parts and all thoroughly mixed to produce a very friable medium easily penetrated by the finest roots.

In cutting slips it has been found most successful to take the tips of shoots or branches of current well-hardened wood. Cuttings seem to grow most easily when about three to four inches long and should carry four to five buds. Non-flowering wood is best, but if not available, break off the flower bud at the tip of the cutting, remove the leaves from the lower stem leaving two or three leaves at the tip. Professionals cut off half of each leaf to lessen evaporation. It is best to make a fresh cut of the slip just before planting and to split the end and, if you should wish a further aid, dip the end of the slip in water and then into rootone to stimulate root growth. To avoid an air pocket at the base of the slip make the soil firm about it and water well to keep the ground always moist.

Camellia nomenclature has drifted into incredible chaos so that one hesitates to touch upon the subject. This confusion is due in a large measure to the vast number of plants which have been pouring in from Japan for many years with unpronounceable names, so that nurserymen have given them new ones of their own choosing. Sometimes the same

1 1 1

Making Dahlias Grow

(Continued from Page Seventeen)

are also removed. This will leave you a straight stem often four to six feet tall with a single bloom at the top. Several plants of the same variety pinched out at different dates will give you *blooms* at different dates.

Feeding for show or exhibition blooms varies slightly from suggestions above. Four weeks before a show date, scatter around the bush in a two-foot circle a generous handful of nitrate of soda and soak in well with a hose. Two weeks later give the same kind of treatment, using a generous handful of superphosphate. Use of the suggestions herein contained have meant beautiful flowers for the writer. May they help you attain the same results.

1 1 1

Rhododendron Show

(Continued from Page Nine)

Special Awards

Best plant in show: Ralph DeClements (*Loderi* var. *King George*), Seattle

Best truss: Donald Graham (*Lady Chamberlain*), Seattle

Cut blooms of hybrid rhododendrons: Dr. and Mrs. B. S. Paschall, Seattle

Group of hybrid rhododendrons: Ralph DeClements, Bremerton

Group of Alpine and hybrid rhododendrons: James Brennen, Woodway Park, Edmonds

Special Mention

Group of hybrid rhododendrons: Mrs. Philip Macbride, Woodinville

camellia is given one name on the Pacific Coast and another on the Atlantic. I think we all have many duplicate plants bought under different names; to mention but one, there is that beautiful white sasanqua called Snow-on-the-Mountain in the East and White Doves in the West. Of course, to all this confusion must

be added the constant flow into the market of new hybrid creations without established names.

The older varieties of camellias which might be called historic by now, such as Lady Humes Blush, we can place fairly well through old pictures and old books.

Color Chart for Choice Camellias

By MRS. PHILIP HART, Portland Garden Club

White

Name	Color	Habit of Growth	Blooming Time
1. Amabilis	White (single)	Tall upright; glossy foliage	Mid-season
2. Caprice	Ivory	Rather upright	Mid-season
3. Finlandia	White	Compact	Mid-season
4. Grandiflora Alba (Lotus)	White	Open form with large leaves	Mid-season
5. Mathotiana Alba	White	Flat spreading; strong growth	Late
6. Nobilissima	White	Tall	Very early
7. Purity	White	Tall upright; great variation in flowers	
8. Snowdrift	White	Upright open; bushy	Late Mid-season to late

Pink

1. Kumasaka	Pink	Upright; compact	Late
2. Magnoliaeflora (Rose of Dawn)	Pale pink	Open; spreading	Mid-season
3. Pink Ball	Pale pink	Upright	Early mid-season
4. Pink Shell	Pale pink	Upright	Mid-season
5. Pink Star	Pale pink	Upright	Mid-season to late
6. Shell Pink	Pale pink	Upright	Very late

Rose

1. C. M. Hovey	Rose	Spreading	Mid-season
2. Daikagura	Rose	Spreading; strong growth	Very early
3. Francine	Rose	Spreading open	Mid-season
4. Grandiflora Rosea	Rose	Rapid grower; open spreading	Early mid-season
5. H. A. Downing	Deep rose	Compact	— — —
6. Imperator	Dark rose	Rather spreading	Early to mid-season
7. Lady Desaumerez	Rose	Upright	Late
8. Princessa Bacciochi	Rose	Bushy; compact	Late
9. Wakanoura	Rose	Upright	Early

Yellow Red

1. Carlotta Grisi (Pope Pius IX)	Yellow red	Spreading	Mid-season
2. Col. Firey	Red	Bushy	Late
3. Elena Nobile	Yellow red	Upright	Mid-season
4. Emperor of Russia	Deep red	Upright	Late mid-season
5. Flame	Red	Upright	Late mid-season
6. Goshō-guruma	Yellow red	Upright	Late
7. Monjisú	Yellow red	Low growing; compact	Mid-season to late
8. Te Deum	Very deep red	Rather open	Late
9. Vittorio Emanuele (Blood of China)	Rose red	Compact	Late
10. Ville de Nantes	Red	Bushy	Mid-season to late

Variegated

1. Bella Romana	Pink with white stripe	Bushy	Mid-season
2. Chandleri Elegans	Rose variegated with white	Open spreading	Mid-season
3. Fanny Bolis	Rose and white	Strong spreading and bushy	Mid-season
4. Lady Audrey Buller	Rose and white	Strong grower	Early
5. Monjisú Variegated	Yellow red	Low	Late

Sasanqua

1. Apple Blossom	Blush	Upright and bushy	Early
2. White Dove	White—double	Spreading	Early

Reticulata

1. Reticulata	Rose	Open spreading	Mid-season
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 Douglas, Mrs. Walter, Seattle
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 Dowling, Mrs. J. Thomas, Winslow
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 Duncan, Mrs. Gordon, Seattle
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 Dunlop, Mrs. M. E., Seattle
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 Dunn, E. B., Seattle
 Dunn, Mrs. J. W., Seattle
 Dunn, Mrs. Mary B., Seattle
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 Eddy, Mrs. William, Bellingham
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 Enger, Mrs. Harold, Tacoma
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 Fisher, Mrs. O. D., Seattle
 Fisher, Mrs. W. A., Seattle
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Harris, Mrs. W. H., Seattle
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Hayes, Mrs. Robert, Seattle
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Jones, Mrs. O. W., Seattle
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Jones, Mrs. W. Bruce, Seattle
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Kelly, Mrs. W. R., Seattle
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Kelsey, Harlan P., East Boxford, Mass.
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 Unit 1, Seattle
 Lake Washington Garden Club,
 Unit 2, Seattle
 Lake Washington Garden Club,
 Unit 3, Seattle
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 Unit 4, Seattle
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 Makin, Mrs. K. W., Mercer Island
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 Mallory, Mrs. Howard, Seattle
 Malmo Nursery, Seattle
 Maltais, Mrs. Olga, Marysville
 Manito Garden Club, Spokane
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 McAusland, Robert, Seattle
 McAusland, Mrs. Robert, Seattle
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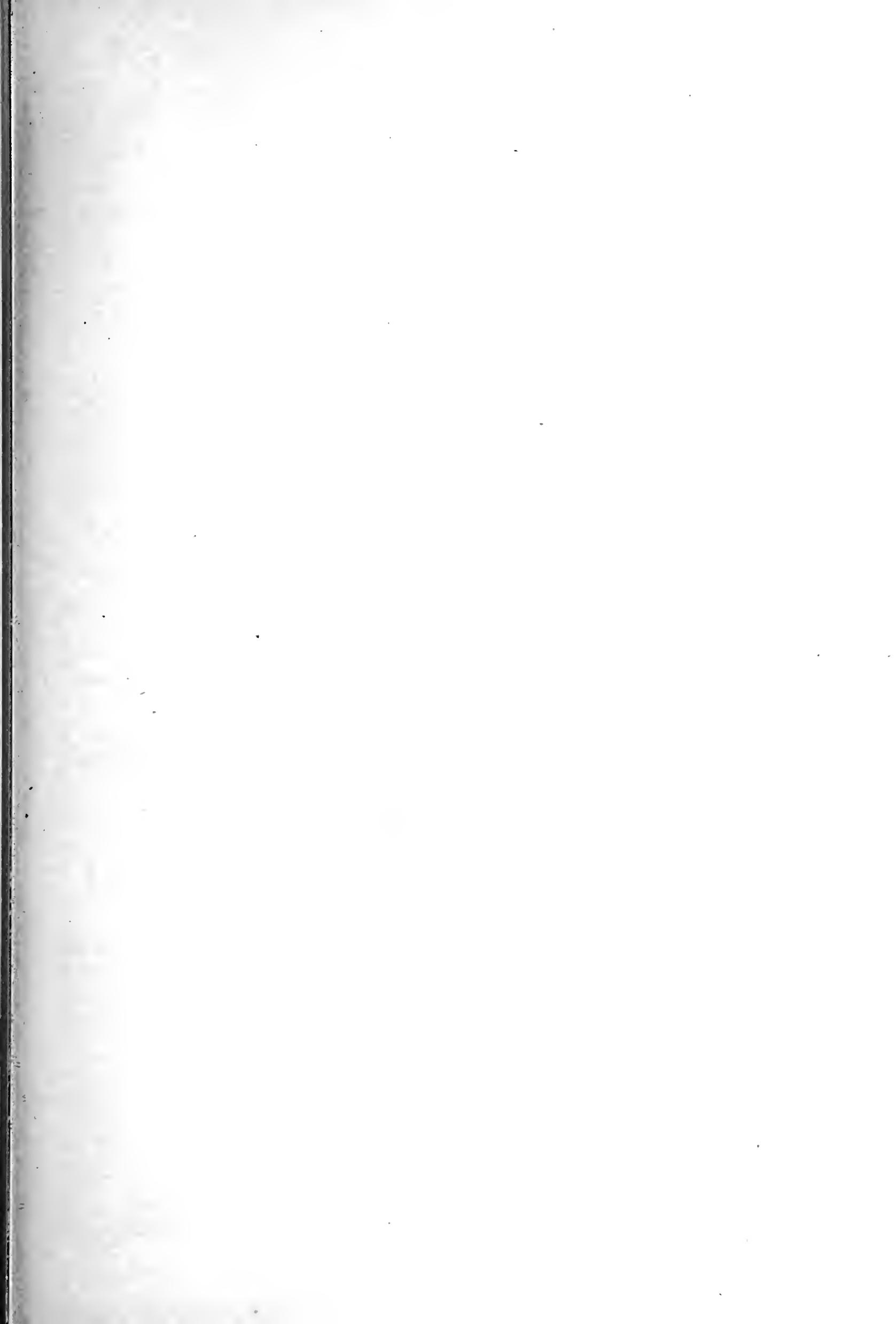
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